



PUBLISHED EVERY FRIDAY

AT

33, TOTHELL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"

Telephone No.: WHITEHALL 9233 (8 lines)

Annual subscription payable in advance and postage free

British Isles and Abroad..... £2 5s. Od.

Single Copies One Shilling

Registered at the General Post Office, London, as a Newspaper

VOL. 80 NO. 1

FRIDAY, JANUARY 7, 1944

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DIESEL RAILWAY TRACTION SUPPLEMENT

The January issue of THE RAILWAY GAZETTE Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready

NOTICE TO SUBSCRIBERS

Consequent on the paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list and will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE possesses the necessary permit and facilities for such dispatch. We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 4.30 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

The New Year Honours List

THE New Year Honours List contains the names of a number of those well-known in the railway industries, both of this country and overseas. Viewed in the light of the extraordinary service which the British railways have rendered during the present conflict, it might appear that small recognition is forthcoming on these occasions; but it may be that in this matter it has been decided to await the completion of the task. In the present list Sir Thomas Royden, Chairman of the London Midland & Scottish Railway Company, receives a barony, in recognition of the public services he has rendered. Among the Knights Bachelor are Mr. Thomas Somerset, M.P., Chairman, Northern Counties Committee, L.M.S.R., and Mr. J. M. Eddy, who is at present in Argentina as a member of the mission of directors of British-owned Argentine railway companies; others are Mr. G. E. Bailey, Works Director of Metropolitan-Vickers Electrical Co. Ltd., and Mr. Patrick Ashley Cooper, a Member of the London Passenger Transport Board. Mr. A. H. Railing, Chairman & Joint Managing Director of the General Electric Co. Ltd., is also one of the new Knights. Sir Harold Hartley, Vice-President of the L.M.S.R., becomes a Knight Commander of the Royal Victorian Order. As will be seen from the list given on pages 21 and 22, railway personnel overseas is well represented.

Mr. E. J. Missenden on the Future of Railways

Mr. E. J. Missenden, General Manager, Southern Railway, dealt with the future of the railways and the experience of the past twenty-one years in an article in the January 1 issue of *Modern Transport*. To the question: "Cannot further economies be achieved by still more amalgamation of the four companies into one undertaking?" Mr. Missenden points out that today much is learnt from the interplay of four sets of officers working on the same problem. He doubts whether it could be said with any assurance that the progress of steam locomotive design would be accelerated by having one chief mechanical engineer instead of four, and the same considerations apply as to traffic development. In his view, further amalgamation would be bound to restrict development to an extent which would far outweigh any economies. It is his considered opinion that the present groups are large enough to take the rough with the smooth, and small enough to keep alive local contacts and pride of territorial association. The past twenty-one years have seen the four groups face and surmount the immense problems of amalgamation and standardisation; battle their way through industrial depressions, and yet keep their undertakings modern and progressive; and finally, carry a war burden of colossal dimensions. These things could not have been achieved if the basis had been unsound, and Mr. Missenden expresses sober optimism that the system which has served the nation with success for the past twenty-one years will continue to do so after the war—on its merits.

The late Mr. A. L. Gibson

One of the most travelled officers of the L.N.E.R. was the late Mr. A. L. Gibson, whose death at Stevenage on Christmas Eve we record with regret. The old Great Eastern Railway, which he joined in 1899 in the General Manager's Office, had a particular interest in Continental transport by reason of the importance of its service between Harwich and the Hook of Holland. During the 1914-1919 war, Mr. Gibson was on special duties in Paris, and then was attached to the G.E.R. General Continental Agency there during 1919-20. This work took him to various parts of the Continent, and showed his outstanding fitness for the appointment of Assistant Continental Traffic Manager, which he received in July, 1920, on his return to this country. He became Continental Traffic Manager (South) in March, 1924, under the grouping arrangements, and in March, 1930, received the appointment of Continental Traffic Manager for the whole system. He was associated with the inauguration and development of the Harwich-Zeebrugge train ferry, and also with great improvements in the Hook of Holland service. Mr. Gibson's work included the introduction of weekend cruises from Harwich and the establishment of through passenger and goods tariffs with Continental stations. For fifteen years he attended the meetings of the European Timetable & Through Carriage Conferences, and visited practically every European capital. He was one of the permanent delegates of the British railways to the annual conference of the International Union of Railways, and his work for Anglo-Continental transport was recognised by the honours bestowed upon him by the Monarchs of the Netherlands, Denmark, and Belgium, as we record in our Personal columns (page 19). Some of his literary efforts are mentioned in an appreciation we have received from an old colleague of his, and in this connection we recall the charm of his phantasies for children,

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such as his little volume, "The Tail Tale," written for his small daughter, Pauline, in 1934.

The Late Mr. Robert Killin

Another link with Scottish railways of pre-grouping days is severed by the death at Ayr on December 26 last of Mr. Robert Killin, C.B.E., the last Superintendent of the Line of the former Caledonian Railway. After grouping, he held on the L.M.S.R. successively the positions of General Superintendent (Midland Division) in 1923 and of General Superintendent (Northern Division) 1924-32, when he retired after 50 years' railway service. Otherwise, the whole of his working life was spent on the Caledonian Railway. He began in 1882 as an apprentice and rose steadily in the service on the traffic side. In 1908 he became Assistant District Superintendent of the Western Division of the line, extending from Beattock in the south to Greenhill in the north, and two years later became Superintendent of the same division. Appointed Assistant Superintendent of the Line in 1912, he was promoted in 1916 to be Superintendent of the Line, a position which he held until grouping. Mr. Killin made a special study of safety in railway working and was closely associated with the improvements in freight train operation which had been effected on the Caledonian Railway. He was an enthusiast for railway ambulance work, and was a member of the first Caledonian Railway team to gain Challenge Cup honours. He possessed a genial and outstanding personality which greatly endeared him to his railway colleagues.

Livestock Rates on Argentine Railways

As was recorded in our issue of December 24, the Argentine Government has issued a Decree authorising an increase of 10 per cent. in rates for the carriage of livestock on all privately-owned railways in Argentina, as well as on certain of the State-owned lines. The Decree describes the change in the tariff as "experimental," and makes the higher rates valid until June 30, 1944. More important, perhaps, than the immediate benefit to the British-owned railway companies of the higher rates, is the reception which the move has had in the Argentine. *La Prensa* has welcomed the increase in livestock rates as a means of lessening the very serious problem of maintaining an efficient transport service, and has expressed satisfaction with the attitude of the authorities, which, it suggests, should tend to put a stop to the hostile and unjust attitude in which foreign capital invested in the railways was being treated. *La Prensa* is a newspaper of considerable importance and that it has adopted a favourable tone to the railways at present, when the Anglo-Argentine Committee is discussing their future, may not be devoid of significance.

Overseas Railway Traffics

A better tendency in the stocks of British-owned Argentine railways is being maintained and the improvement in traffic receipts continues, notably on the Central Argentine and the Buenos Ayres Great Southern, which for the 25th and 26th weeks of the financial year together show respective increases of £56,334 and £25,200. The Brazilian Railway financial year ends on December 31, and the returns so far available give figures for all but six days of that period in the case of the Great Western and the Leopoldina which report aggregate receipts of £881,800 and £1,860,878, respectively, with increases of £256,600 and £277,595. On the Antofagasta the aggregate gross earnings up to December 26, 1943, are shown as £1,483,060, an increase of £332,740 over the corresponding period of 1942.

	No. of weeks	Weekly traffics	Inc. or dec.	Aggregate traffic	Inc. or dec.
		£	£	£	£
Buenos Ayres & Pacific*	26th	114,900	+ 6,060	2,430,300	+ 89,160
Buenos Ayres Great Southern*	26th	182,820	+ 19,740	4,080,840	+ 355,260
Buenos Ayres Western*	26th	58,800	+ 1,200	1,334,820	- 19,020
Central Argentine*	... 26th	175,872	+ 38,472	3,620,490	+ 332,508
Canadian Pacific	... 51st	1,255,400	+ 94,000	57,665,600	+ 7,853,000

* Pesos converted at 16½ to £

On the Canadian Pacific Railway for the first eleven months of 1943 the aggregate net earnings of £8,838,800 showed an improvement of £240,200.

Central Uruguay Railway

For the year ended June 30, 1943, there was an increase of £238,808 in gross receipts due to tariff increases introduced in January, 1943. As against this there was an advance of £272,580 in expenditure caused by higher cost of fuel and wage increases which operated throughout the year. After adding sundry credits and deducting full interest on debenture stocks (£238,750, against £68,453 for 1941-42), there is a debit

balance of £212,875 to carry forward, as compared with a credit of £12,616 brought in.

	1941-42	1942-43
	£	£
Passenger receipts	296,632	311,640
Goods receipts	650,160	766,614
Live stock receipts	333,331	424,641
Gross receipts	1,351,279	1,590,087
Working expenses	1,295,522	1,568,102
Net receipts	55,757	21,985

Many locomotives have had to be converted to burn wood. Originally designed to burn oil, their grate areas are so small that the local soft woods are useless for operating purposes, and the company has been forced to import hard woods. Even so, the haulage of the locomotive is seriously curtailed and the useful load cut further by having to haul extra tenders.

Cargo Coaling Plants

Various kinds of locomotive coaling plants and their uses were described in a series of articles which appeared in our July 9, July 23, and August 6 issues. Mr. J. Dalziel, formerly Assistant Electrical Engineer, L.M.S.R., in a series of articles which commences elsewhere in this issue, has now made a detailed survey of the principles and installations involved in loading coal on board ship from railway wagons. Commercial considerations and questions of service to traders and the public, affect cargo coaling plants to a far greater extent than do locomotive coaling plants. Various methods of shipping coal have been used in this country; the principal of these are the familiar wagon-hoist cranes and, of recent years, conveyors. The most extensively used type of coal-shipping plant is the hydraulically operated hoist, and in his first article Mr. Dalziel deals at some length with various of these. At the present time, when the most economic use of coal is essential and it is imperative to avoid all unnecessary waste, the use of the most efficient coaling plants is desirable, but equally, the exigencies of wartime make it almost impossible to embark on new installations of this kind. It is unlikely, however, that the need for the most economic handling of coal will be short lived, even with the return of peace.

Invention's Part in Industry

Not until peace returns will it be possible to know how great a stimulus the war has given to inventive powers, not only in this country but throughout the world. It is obvious, of course, that in many directions it has been very great, and in the adaptation of wartime inventions to peacetime pursuits there will be scope for major developments in a wide variety of matters which impinge on the daily lives of the peoples. Mr. Oliver Lyttelton, Minister of Production, as we recorded in our December 3 issue, pointed out recently that two or three fundamental inventions might well replace in capital wealth the whole of the money that has been spent in the war. Primary inventions are few, but each of these opens up a field for many secondary inventions. In an article on page 10 some account is given of an address by Mr. E. W. Moss, M.I.E.E., Chairman of the Measurements Section of the Institution of Electrical Engineers, in which he dealt with the part played in industry by inventions and the law in relation to them.

Linking the Isolated Railways of Brazil

Brazil's entry into the war and the restrictions imposed on its coastwise shipping, combined with shortage of petrol and oil, have emphasised how precarious in some respects was the pre-war rail transport system. The geographical formation of the country, with its long coastline and numerous ports, lent itself to the development of the seaboard and the building of long railways from the ports to serve the interior. As a consequence, the interchange of products from one part of the country to another suffered the inconveniences of triple handling: first from the zone of production to the port, secondly from port to port, and thirdly from the port to the interior consumption area. The construction of railway links between the various systems of lines based on ports would have obviated the present difficulties, for, although much has been done in recent years to remedy what has long been recognised as an economic and strategic deficiency, there are still numerous railways without internal connection, particularly in the north of the country. An article outlining recent developments in the construction of connecting railways is published on page 15.

A German Canard: Our Tube Armed Guards

The recent mistake of a London daily newspaper has been seized promptly by the German Propaganda organisation, and German-controlled radio stations in Paris and Oslo made the statement on December 29 that: "Armed guards have been posted in all London tube stations with orders to shoot, in order to pre-

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vent panic if German reprisals begin. Posters appeared in the stations during Christmas telling travellers that they must obey the guards. The posters caused considerable alarm." The poster in question is one which was issued by London Transport as long ago as June, 1940, for exhibition on sub-stations, garages, and other places to which the public normally has no access—but not ordinary passenger stations—and the wording as shown by the reproduction in our issue of July 11, 1941 (page 36) was: "A number of armed guards are being posted in this property. All employees of the Board and others when challenged by these guards must immediately HALT and obey the sentries' instructions. Men passing to and fro on routine duties must obey the instructions of the sentry, however many times they may be halted by day or by night. Failure to do so may result in tragic accidents, as sentries have orders to fire on all persons who do not obey their instructions." Routine renewal of weather-damaged posters recently was misinterpreted by the London daily as the exhibition of a new announcement, and Germany has not been slow to make capital of this.

U.S.A. Railways in Wartime

ARTICLES in our issues of October 22 and December 3 described the remarkable work which the American railways are doing during the war, both collectively and individually. These articles and the editorial on statistics in our December 17 issue pointed out that full information was available about traffic movement in the United States whereas little or nothing was published about the performance of our own railways. The Interstate Commerce Commission not only circulates annual statistics while our Ministry of War Transport holds back our figures, but also reports promptly on current developments. Here is a striking example of America's capability for turning out red-hot statistical and accounting returns.

At the beginning of November the Interstate Commerce Commission gave details of the achievements of the U.S.A. railways during the month of August when traffic reached a new peak. It is a fine feat of office organisation to collate information for 232,000 miles of railway and reduce the mass of material to a succinct statement in two months or thereabouts. We would not suggest that the Ministry of War Transport attempts to imitate this exploit, but there is no apparent reason why it should not publish a brief quarterly statement of results which are readily available and an annual set of returns adjusted to suit present conditions. The case for this is made still stronger by the fact that a number of isolated statistics regarding the railways' war effort have been made public in the brochure "British Railways in Peace and War," as recorded in last week's issue. With the aid of the I.C.C. statistics, our contemporary, the *Railway Age*, was able to publish on November 13 a comparison of results in August last with August, 1929, the railways' most profitable pre-war year. In spite of the submarine menace this number of the *Railway Age* was in our hands about the middle of December and we have pleasure in quoting part of its story of what is occurring in the States.

The railways rendered 56 per cent. more freight service in August, 1943, than in August, 1929, and carried 31 per cent. more freight revenue, though the revenue per ton-mile was less by nearly 16 per cent. Passenger business increased by no less than 173 per cent., but passenger revenue by only 92 per cent.; the revenue per passenger was down by 26 per cent. Gross earnings of over 800 million dollars in August last were a record and exceeded the takings for August, 1929, by 36·5 per cent. Operating expenses increased by nearly 18 per cent.: their ratio to revenues fell from 67·5 in 1929 to 58·4, a decrease of nearly 13·5 per cent. Though the number of employees was 20 per cent. less last year, their average wage advanced by at least 40 per cent. Taxes were five times as heavy as in 1929 and in the end the net operating income of the railways last August was 17 million dollars, or 12 per cent., below the income for August, 1929.

The railways are thus rendering a meritorious service without excessive profit to themselves. The *Railway Age* is justified in labelling its instructive article "Efficiency for Victory" and it is gratifying that the American government and people know exactly what is happening. At the coming-of-age luncheon of the four British groups held on December 22, Lord Leathers gave generous praise to their war work, saying that the railways were still the mainstay of the inland transport system of the country and as such were still an indispensable part of the military machine. He added that few people seemed to realise the extent of the railways' achievement. May we suggest, with all deference, that the Minister has the remedy for this state of ignorance in his own hands? He has merely to authorise his Department to let the public have the facts and figures now hidden in office records.

The Road Motor Haulage Industry

ALTHOUGH mechanical road transport was used for the carriage of merchandise long before the last war, it was after 1914-19 that the road haulage industry in its motorised form really came into being. With a large measure of truth, it may be said to have been born at Slough, where discharged soldiers, who had driven mechanical vehicles during their period of service and were anxious to turn their experience to good account, purchased reconditioned lorries from the Disposals Board and took them home in order to earn a living by fetching and carrying for their neighbours. These men were pioneers blazing a trail, and, like pioneers, had to take life as they found it. They knew little about the economics of transport, but they soon discovered that they could make a good living by carrying traffic which the railways called "highly classified." Money was easy in those days, although life, gauged by hours of duty, may have been hard. There was no legislative control, and the man who was unlucky enough to fall by the wayside, either through sheer bad luck or because he tried to give his employees decent conditions of service or to stabilise his rates, was by-passed by his fellows who had the better staying power. Such conditions produced robust individualism, which is today both the strength and the weakness of the road haulage industry. These ex-Service men impinged on the businesses of old-established firms who undertook local cartage by horsepower and who were beginning to substitute mechanical power for their longer-distance haulage work, and, under duress of competition, forced them also to join the rough and tumble.

In time the Government intervened, first with the Road Traffic Act, 1930, which laid down maximum hours of work; made third-party insurance obligatory, and also controlled the speed limits for certain types of vehicles. This was followed by the Road & Rail Traffic Act, 1933, under which it became necessary for a licence to be obtained by anyone wishing to carry merchandise in a road motor vehicle. This Act also ensured vehicle fitness. In 1934 the Road Traffic Act, in the interests of public safety, imposed a driving test, and tightened up the penalties for dangerous driving, and in 1938 the Road Haulage Wages Act set up a Central Wages Board and provided for the enforcement of scales of wages and conditions of employment of "A" and "B" Licence drivers. The major freedom which Parliament has left to road hauliers is in respect of the rates which may be charged, and this freedom has been used to the uttermost. It is of particular note that, although from their very beginnings the railways have been curbed in their every functioning by legislative control, which has intensified with the passage of time, the road industry had several years—after it had escaped the nursery stage of being accompanied by a man walking with a red flag—during which it had every freedom to develop in its own way, and even now has very many fewer controls and restrictions than have the railways, although those it has—their shackles not having worn smooth—are considered repressive. While freedom enables a young industry to have an untrammelled start in life, it is inevitable that if, at a later stage, rules and regulations making for common standards of conduct have to be imposed, such restraints are irksome and may, in fact, cause definite hardship to individuals.

The number of workers directly employed in Great Britain (in 1938) in the road transport of merchandise was 560,000, of which 220,000 were engaged in public transport ("A" and "B" licensees). In addition, there were many thousands employed in garages and in the distribution of liquid fuel. There are more licensed motor vehicles (of all descriptions, excluding motorcycles) per mile of road in Great Britain than in any other country, the figure being 14·6 (1938); Belgium (1937) comes next with 10·5, and then the U.S.A. (1937) 9·7. At the bottom we find Japan (1937) with only 0·2. In total numbers of vehicles the U.S.A. of course is far ahead of Great Britain, with 29,654,847 against 2,622,521 in this country.

The licensing of road motor vehicles, which was made compulsory under the Act of 1933, divided motor owners into the following three main categories:—

1. *The "A" Licence.*—The owner who carries exclusively for hire or reward. The possessor of this licence has the freedom of the country; he could not, however, increase either the number or the capacity of his fleet of vehicles without proving to the Licensing Authority that his services were needed and that existing providers of transport were unable to meet the public demand. Other road hauliers, the railways, coastal carriers, and canals can oppose his application. Likewise, a newcomer to the business has to prove public need, and as, in practice, this is difficult, the existing "A" licensee has, to all intents and purposes, protection from the competition of new firms of public hauliers. The licence is granted for five years,

and the holder is subject to the perils of a public inquiry when seeking renewal.

There is also the "A" Contract Licence under which the vehicles, while being maintained and operated by the owner, are put at the complete and exclusive disposal of the user.

2. *The "B" Licence.*—The owner using his vehicles partly for hire and partly for his own business. The condition of grant of this licence usually limits the holder both in area and in the type of goods he may carry for reward. He has to face the same inquiries as does the holder of the "A" licence, but more frequently, as he must obtain a renewal every two years.

3. *The "C" Licence.*—The private operator who uses his vehicles solely for his own business and is granted his licence on demand as a matter of right.

There is also a special Agricultural "C" Licence to enable the agriculturist, besides transporting his own traffic, to carry that of other farmers.

The following statistics show the numbers in each category in 1936 and 1938; the latter is the last date in respect of which official figures were published:

	No. of holders	No. of vehicles
	1936	1938
"A" licences	25,648	22,999
"A" contract licences	2,084	3,967
"B" licences	34,100	34,120
"C" licences	161,221	178,298
	223,053	239,384
	460,016	513,147

The number of ordinary "A" Licence holders is declining on account of amalgamation within the industry, and, although the number of vehicles running under this licence has also declined, the carrying capacity has tended to increase. The "B" Licence holders are stationary in number, but vehicles in this class show an increase. The number of "C" Licence holders has increased rapidly, and likewise the number of vehicles. The "A" Contract vehicles which, to all intents and purposes, are "C" licensed vehicles, being used exclusively by the hirer and simply maintained and operated by the owner, also show a considerable increase.

A striking feature of the road transport industry, which is the result of its beginnings, is the smallness of the management unit. In this lies much of its strength, because the personal and direct contact between the manager and the customer is maintained, and the customer's wishes and whims can be met in a way which is not practicable in a large organisation. Approximately one half of the "A" Licence holders and three-quarters of the "B" Licence holders operate only one vehicle each. The overall average is only $3\frac{1}{2}$ and $1\frac{1}{2}$ vehicles respectively.

The "A" and "B" Licence holders constitute the public road haulage industry, and there are some 60,000 independent hauliers controlling some 150,000 vehicles. These hauliers can be divided into three main categories: (a) local carriers going 25-30 miles from their base; (b) short-distance general hauliers serving an area within which vehicles can get home at night, which, in practice, means about 50 miles, with a maximum of 80 miles; and (c) the long-distance carrier who is well organised with a proper rostering of hours of duty by which an exchange of drivers at vantage points along the line of route enables the men to get home at night. Alternatively, he may have hostels where reasonable amenities are provided for men when away from home.

The very short distance haulier who carries almost exclusively within the immediate precincts of towns and villages is the lineal descendant of the old-fashioned country carrier, and performs an extremely useful social function. He is more than a haulier and frequently undertakes small commissions of purchase or sale on behalf of his clients, who may be isolated in lonely houses or farms away from shops. This type of haulier usually sticks to his beat and does not often enter the competitive field.

It is usually the medium class of haulier—he who works within an area just so far as he can from home so as to get back the same night—who is the disturbing element. He possesses on the average two vehicles which he has to keep fully occupied hauling anything he can secure, and rather than return light will often carry a back-load at a cut rate, thus possibly encroaching on the preserves of some other haulier to whom the traffic in question may normally be an outward load. Apart from doing his best to satisfy his customers, he has no responsibility to maintain a regular service or to be consistent in the charges he makes. If he has an "A" Licence he has the freedom of the whole country and can make occasional sorties into long-distance work, and in fact at slack seasons can migrate and undertake haulage in areas more happily situated, thus competing with other hauliers on their "home ground."

The established long-distance haulage firm is an organisation of responsibility, as it owns a considerable fleet of motors and has a reputation to maintain both for service and stability. Services are run at fixed times and each organisation has its own rates schedules, but there has been no attempt to adopt

any universal system of rates. Although the large long-distance firms are powerful in themselves, they possess only some 16,000 motors for long-distance work, and numerically represent a very small proportion of the whole industry; nevertheless, their individual stake in the prosperity of the industry is considerable. The long-distance firm, like the railways, frequently employs a collection-and-delivery organisation because the large motors which are used for the trunk haul cannot be used economically for town work.

There are no figures extant of the use to which the vehicles are put, but it must be obvious that, of the "C"-licensed motors which ply exclusively in connection with the business of the owner, the overwhelmingly greater number is used for collection-and-delivery work by the local greengrocer, dairy, laundry, etc. There are many instances, however, where the "C" licensee prefers to use his own transport also for both medium and even long-distance haulage. It may be that he can arrange two-way loads of his own traffic, or there may be commercial considerations of one sort or another which outweigh the fact that public hauliers could frequently undertake the work more cheaply. The owner in such cases regards his transport department as one of the sections of his own business for delivering his finished products to his customers and for bringing in the returned empties and sometimes the raw materials. It is obviously fair and reasonable that a shopkeeper should deliver the purchases of his local customers, but at the other end of the scale it is a matter for judicial consideration whether it is nationally economic for an individual trading organisation to undertake its own longer-distance haulage when there is public transport available (which must in any case provide a service in order to meet the needs of the rest of the community) which is able to undertake the work within its normal functioning.

Apart from the old-established horse transport firms which, in keeping with the times, adopted mechanical transport, the road haulage industry has been recruited largely from small beginnings on an individualistic basis, and for the mutual protection of these small owners there have emerged seven large national associations of hauliers, in addition to a considerable number of local ones in different parts of the country. The big seven cater for different types of haulier, as indicated by their titles, but they are not exclusive and do not apply a strict functional test to their members.

The associations are:—

Commercial Motor Users' Association	... ...	Approximately half and half "A" & "B" licensees, and "C" licensees, with some passenger service operators
Scottish Commercial Motor Users' Association	... ...	Largely "A" and "B" licensees, with some "C" and passenger service operators
Associated Road Operators	... ...	All "A" and "B" licensees
Scottish Carriers & Haulage Contractors' Association	... ...	All "A" and "B" licensees
National Road Transport Employers' Federation	... ...	Largely carriers of "smalls"
National Conference of Express Carriers	... ...	Largely carriers of "smalls"
National Association of Furniture Warehousemen & Removers	... ...	... ...

Although these are distinct and separate organisations, each looking after the interests of its own members, a Standing Joint Committee of Road Hauliers Organisations, composed of representatives from each association, has been in being for some years for the purpose of negotiating with the railways, the Ministry of War Transport, and other outside bodies. The road associations, in view of the necessity of concentrating their strength, and also for the purpose of discipline within their own ranks, are in process of fusing their interests, and a new all-embracing organisation is in course of construction. Under this scheme the existing associations will be wound up, and in their place will be a National Road Transport Federation within which three independent and autonomous bodies will function, namely:—

Road Haulage Association	... ...	"A" and "B" licensees
Traders' Road Transport Association	... ...	"C" licensees
Passenger Vehicle Operators' Association	... ...	Such passenger-carrying operators as are within the existing seven organisations

The Federation will link the three associations and will be the authority entitled to speak and act for the road transport industry when the interests of all three associations are identical and it is desired to emphasise matters of universal importance; otherwise each association will represent its own section on matters which concern it alone. The achievement of this new organisation marks a definite stage in the progress of the road transport industry, and cannot but be conducive of good. It is the intention of the industry to form a general secretariat, modelled on the lines of the Railway Clearing House, and to employ full-time officers who are expert in statistics, rates, mechanics, and all the other matters affecting the welfare of the industry.

The foregoing remarks are concerned, of course, almost exclusively with the road transport goods haulage industry. Passen-

ger road transport has a very much more closely-knit organisation. For many years, all the large bus operators were represented in matters of parliamentary and legal policy by the Omnibus Owners' Association, and were also members of the Public Service Transport Association (which dealt more with operating and mechanical matters). There was no very clear-cut division of function, however, and the two associations decided that their interests were so generally identical as to justify complete merger, on the lines described in our issue of January 8 last (page 32). The arrangement became effective on July 1, and the combined body—the Public Transport Association—is the largest passenger transport association in the country, representing the operators of some 39,700 road transport vehicles (buses, trolleybuses, and trams), and ancillary interests.

Madras & Southern Mahratta Railway Company

NO change was made during the year ended March 31, 1943, in the length of line worked by this company, which remained at 2,939 miles, of which 1,123 were broad gauge and 1,816 were metre gauge. The company's share of divisible surplus profits, after deducting income tax, surcharge, and super-tax paid in India, was Rs. 13,09,932 in the year under review, against Rs. 11,37,373 in the year 1941-42, and the total distribution on the £5,000,000 of capital stock is 5½ per cent., the same as for each year since the revised contract of March 24, 1937, became operative. In the accompanying table the figures of earnings and expenses comprise those of company's and State lines and of other worked lines. Earnings from coaching traffic were Rs. 132-99 lakhs more. The exodus of the civil population from coastal areas continued and was followed by their subsequent return during the year. Frequent restrictions on the booking of goods resulted in the transfer of a certain amount of traffic to the parcels service, earnings from which increased by Rs. 27-05 lakhs. Goods traffic earnings advanced by Rs. 64-78 lakhs; 100,000 more tons were carried, and ton-miles increased by 7-5 per cent. General merchandise receipts were Rs. 36-37 lakhs higher, and military traffic earnings, which were four times greater than in 1941-42, advanced by Rs. 30-80 lakhs, but earnings from public coal decreased by Rs. 5-82 lakhs due to shortage of wagons. Some comparative figures follow; 1 lakh is equivalent to Rs. 1,00,000, or £7,500.

	1941-42	1942-43
	Rs. lakhs.	Rs. lakhs.
Coaching earnings	342-86	475-85
Goods traffic earnings	624-75	669-53
Gross earnings	987-01	1,188-53
Working expenses	463-26	531-08
Net earnings	523-75	657-45

Of the total increase of Rs. 67-82 lakhs in working expenses Rs. 39-73 lakhs were in general administration. Repairs and maintenance accounted for Rs. 133-01 lakhs, an increase of Rs. 13-44 lakhs; operating expenses were Rs. 213-12 lakhs, against Rs. 196-63 lakhs, but their percentage on gross earnings was 2 less. Expenditure charged to replacement and renewal was Rs. 34-82 lakhs, against Rs. 36-66 lakhs in the previous year.

Brighton Viaduct

ELSEWHERE in this issue we describe and illustrate the measures taken by Southern Railway engineers to restore traffic over and then rebuild the bomb-demolished section of London Road viaduct, Brighton. Great credit is due to them for the ingenuity displayed in thinking out the scheme so successfully carried out stage by stage and with all essential precautions, and for the speed and quality of the work involved. It is true that they were materially aided by the remarkable soundness of Rastrick's 98-year-old original structure, and by the availability of ample steel-trestle staging of the military type and of Meccano-like utility. Nevertheless much forethought and care were required.

The main problem was the restoration of important communications at the earliest possible moment across a gap nearly 70 ft. long in a masonry arch viaduct 70 ft. in height. Before the temporary bridging of this gap could be undertaken, however, the safety and stability of the adjacent piers and spans had to be secured by heavy shoring and tying. Secondary, but hardly less weighty considerations were the provision of spaces in any temporary structure in which the demolished pier and arches could be rebuilt. The solution of all these problems was (a) the initial building of a temporary three-span steel bridge having two massive military-type steel trestles as its 70-ft. piers, and (b) its replacement later by a two-span bridge sup-

ported centrally on an extension of the masonry pier, by then rebuilt. The trestles used for (a) provided not only a safe and stable superstructure for carrying heavy steam and electric services on the 10-ch. double-line curve 70 ft. above the ground, but also acted as staging for fixing the heavy strutting across the 65-ft. gap. Also, in stage (b) when these trestles had been relieved of their duties as piers for bridge (a), they had their tops removed to allow of the building of the arches, but the remainder of them acted as supports for the centring for turning the arches.

A subsidiary job was the breaking up by pneumatic power and removal by excavator and lorry of over 43,000 cu. ft. of masonry which had comprised the bombed pier and arches; this was completed within three days. The temporary trestle bridge (a) was built on concrete foundations, completed, tested with heavy locomotives, and opened for all classes of traffic at restricted speed within five weeks of the bombing. The rebuilding of the pier in brick-encased concrete reinforced with rails on new foundations, the change-over from temporary bridge (a) to (b), and the construction of the arches were all completed in little more than eleven weeks. The masonry and other workmanship and materials were in keeping with the best traditions of the British railways, despite the speed with which the work was carried out. Apart from the parapet, the rebuilt section of the viaduct is finished in bricks that match those used in the original structure, and will be indistinguishable from the remainder in a few years' time.

Apprentice Training

ONE of our foremost aero-engine designers, Sir Roy Fedden, who recently headed the Fedden Mission to the U.S.A., has devoted much time and effort to describing for the benefit of English engineers the very advanced position of technicians in America and the importance attached to adequate designing and planning methods. It would seem that we in this country have much to learn from our colleagues over there, for even in this progressive age, our modes of training future technicians is still inclined to be of the "hit or miss" variety and too much is left to the individual initiative of youth itself. In railway factories there is still room for improvement and here, it should be remembered, we are dealing with the most excellent human material by reason that the sons usually follow on the traditions of the fathers, and generation after generation of sound craftsmen enter the larger railway works.

We are aware that the companies generally foster the ambitions of the more intelligent youths who enter railway service, and facilities are given for study on a prescribed number of mornings and afternoons each week. The matter, however, should go further than this, and among other things, the personal interest of the Works Manager or Superintendent in his most promising young men is an elementary factor in the inducement of results. Furthermore, it is only human nature to ask what advantages are likely to be gained by a course of intensive study and the passing of examinations.

Although some companies have held out the necessary inducements in post-apprenticeship vacancies, there are others whose interest in their promising young men has been so slight that they have lost their services and so robbed the railways of those who, perchance, would have done great things. It is possible that the time has come for the various engineering departments of our great railway companies to review their systems of training and seriously to consider the truism that the quality of future attainments and efficiency will be in direct proportion to the quality of staff coming to maturity.

VARIABLE ADHESION.—It is frequently assumed that the coefficient of adhesion (that is, the adhesive weight divided by the maximum obtainable tractive effort at wheel treads) is a constant. On this assumption one deduces that the maximum power of a locomotive will be developed at a speed lower than must be reached for this to happen in actual practice. In calculating this critical speed for French, Spanish, and other locomotives, Señor Roman Martínez de Velasco, writing in *Ferrocarriles y Tranvías*, adopts the formula of Parodi for the coefficient of adhesion. According to this formula, the speed in km.p.h., increased by 100, is divided by 100 K where K is a coefficient that depends on the condition of the rail. For a dry rail K is taken as 0-315, for a wet rail it is 0-215; a safe figure for normal calculation is 0-24. A little consideration will show that according to Parodi the limiting tractive effort at 100 km.p.h. is only a half of that at starting. Using this formula Señor Velasco makes some critical-speed comparisons of considerable interest.

January 7, 1944

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Streamline Locomotives

6, Armitage Road, Birkby,
Huddersfield. January 1

TO THE EDITOR OF THE RAILWAY GAZETTE
SIR.—In reply to Sir William Wood's letter appearing in your December 31 issue, it may be mentioned that not only was the material for thousands of tons of iron and steel railings prepared before the war but the railings were made and installed, and yet the material has been commandeered even at the cost of expensive uprooting.

External streamlining of locomotives was no doubt justified "on certain runs" but they were few in number and in any case do not take place in wartime. Internal streamlining is certainly more advantageous but even that is much less valuable than generous port-openings.

Yours faithfully,
R. HOWARD

Government-Controlled Colonial Railways

London. December 22

TO THE EDITOR OF THE RAILWAY GAZETTE
SIR.—I should like to take the opportunity of supporting the remarks of your correspondent, Transportus Superbus, in your November 19 issue. Every executive officer employed in the service of Government-controlled Colonial railways will appreciate the remark that the undertaking is efficiently run, in spite of being a State railway.

Officers with enthusiasm and energy, and with a keen desire to give their full attention to the technical part of their work find that more than half of their time must be given to the never-ending pettifoggery details which have always been associated with Government regulations, correspondence, and routine. For these officers to carry on and obtain the good results they have, reflects great credit on them and they still refuse to be disheartened by the fact that their work receives so little public recognition. We hear much of the advancement and encouragement of the backward races and much is made of the need for the replacement of the European officer by suitable local candidates, but it should be appreciated that "efficiently-run" railways are due to these European officers, in spite of the cumbersome Government machine and low grade labour.

It may be remembered that in many colonies after the last depression, the call was for the Government railways to be placed on a commercial basis.

Yours faithfully,
TRANSPORTUS VERITAS

Disclosure of Place Names

G.H.Q., Paiforce
December 27

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—In your issue for September 10, have not you or the Censor gone to rather ridiculous extremes in hiding the locations of the new power-signalling installation as "in the east of London" and of the destination of the "Holiday train into war special" as a "southwest coast resort"—though surely Manchester should have been discretely veiled as a "north-western industrial town." Surely it would not hinder the war effort or give information to the enemy if place names could be given more often, and it would much add to the interest of at least one temporarily exiled subscriber.

Regarding the paragraph (I thought in wartime it was illegal to run services which did not exist pre-war?), a wonderful picture is conjured up of the train at the platform with its passengers rejoicing at getting a seaside holiday at last and the guard waving his green flag. Suddenly up rushes the Divisional Superintendent—or should it be Winston?—with an impassioned appeal to the passengers to let the engine go. To which all agree with enthusiasm and the scene fades with the engine steaming away to its North African (again is it safe to mention the place as the enemy may not know we are there?) special amid a crowd of cheering passengers and a shower of confetti from their torn up tickets (is your journey really necessary?).

One other point—in the map of Argentine Railways in the issue of October 1, there are slight inaccuracies which even shortage of staff does not condone. The State Railway from Pto. Diamante to Curuzú Cuatiá and branches is standard and not metre. Also Libres (opposite Uruguayana with its proposed International Bridge), a large city, is excluded, whereas several villages are shown.

On the other hand, I offer you my very heartiest congratula-

tions on having nobly resisted the temptation to "disclose" or "reveal" items, and on the regularity of arrival, and continued high standard of interests of *The Railway Gazette*.

With possible apologies for being super-critical.

Yours faithfully,

H. L. HAWKER, CAPT. R.E., MOV. & T.N.

Education and Transport

London, E.C.

January 1

TO THE EDITOR OF THE RAILWAY GAZETTE
SIR.—Please do not listen to the suggestion made by Mr. Percival, in the letter printed in your December 31 issue, that you should omit all reference to education in the personal announcements which appear from week to week. It is instructive to have the full history of men who rise to important transport posts. Education, or the lack of it, does make a difference at every stage in the career of most people and railwaymen can now take advantage of the opportunities for study which are offered so freely by our Universities and Technical Colleges as well as by the railway companies themselves. Their opportunities go a long way to equalise prospects of promotion and the mere fact that a young man has been at Eton will not get him far in the railway service, though there is a good deal to be said for the educational methods of that famous school as the historian, E. L. Woodward, explained in the book entitled "Short Journey" which he wrote in Great Western trains between Oxford and Paddington.

Many other public and grammar schools have excellent systems on different lines and would not admit for a moment that they are inferior to Eton—they do not know Mr. Percival's word "lesser." Not far from this room stands the City of London School which in one year furnished Cambridge with both the Senior Wrangler and the Senior Classic and not long afterwards sent its head boy, H. H. Asquith, to carry off the first scholarship at Balliol College, Oxford. We should like to see more boys from these schools, where training is on the hard side, taking up transport work in future and to watch their progress by the aid of the Personal columns in *The Railway Gazette* and other journals.

I am, etc.,

CIVIS

The First Three-Cylinder Locomotive

The Institution of Mechanical Engineers,
Storey's Gate, St. James's Park,
London, S.W.1. December 24

TO THE EDITOR OF THE RAILWAY GAZETTE
SIR.—The excellent memoir of the late Mr. J. G. Robinson published in your December 17 issue, rather implies that the G.C.R. three-cylinder 0-8-4 tank engines of 1907 were the first simple three-cylinder engines in this country. May I refer to your double issue of December 18 & 25, 1942 (pp. 608-611), in which Mr. Walton describes "the original 3-cylinder locomotive built under Stephenson & Howe's patent of 1846." The inside cylinder, however, was not of the same diameter as those placed outside. The first three-cylinder simple engine to have cylinders of equal diameter is shown to be the Decapod which was built in the Stratford Works of the Great Eastern Railway. Mr. Walton mentions certain unusual features of the Decapod and goes on to state that "The first 3-cylinder engines which might be said to be normal in all respects were Robinson's G.C.R. 0-8-4 tanks of 1907."

By all means let credit be given to Mr. Robinson for his 0-8-4s; but I think it should be more widely recognised that the Decapod represented a mechanical engineering *tour de force* of the very highest order. A close study of the general arrangement drawings published in the technical press at the time of its debut is well worth while, and it was a very great pity that the "permanent way" objections to it could not have been overruled so as to prevent such a magnificent effort from becoming fruitless.

Yours very truly,

W. O. SKEAT

Control Offices

London, N.W.
December 18

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR.—On page 626 of your December 17 issue, you describe the layout of a new L.M.S.R. Control Office, but say nothing about the operating methods in force. Every railway has followed the lead of the old Midland Railway and installed controls, but it is to be feared that some of these offices have slipped into routine habits; they spend too much time on recording and too little time on guiding the movement of traffic. In many districts

the direction of locomotive power does not receive sufficient attention, possibly because some controls cover too wide an area. In view of the shortage of locomotives and the rising cost of running them, the need for looking after their working can hardly be exaggerated.

One would therefore like to know how the work of this L.M.S.R. office is organised. There is nothing new in having sectional diagrams above the desks or maps on the wall. It would be interesting to know whether the controllers use the graph system for recording the passage of trains or compile separate cards for important trains in the old fashioned way. The graph system tends to keep the staff alert and gives a complete picture of the working over a section of line for a suitable period. But the essential thing is to choose the staff for controls judiciously and them to take care that it does not get into grooves. After all a control is simply a telephone unless there is a decisive operating instinct behind the instrument. The rest of the office equipment is but "leather or prunella."

Yours faithfully,
STATISTICIAN

Decauville Track

Westminster, S.W.1. December 17

To THE EDITOR OF THE RAILWAY GAZETTE

SIR.—I recently had occasion to be associated in a search through a very well-known technical and engineering library for information on Decauville track which was urgently required by a serving officer. The search yielded negligible results, and I was astonished at the paucity of published information in the technical press. This type of track must be very widely used at the present time in view of current military requirements, and I should think it would be of value to your readers if any

reference could be given showing them where to get information on this subject.

Yours faithfully,
METROPOLITAN

[The name Decauville is a trade name, applying principally in France to narrow-gauge railway materials made by the Decauville Company, in a similar way to the railway materials made here for use in this country and for the export trade generally are usually described under the name of the principal makers as "Hudson's." The Decauville Company was one of the first in the narrow-gauge railway trade and the original idea was for light rails to be riveted to narrow-gauge sleepers in complete sections. Although this was satisfactory for internal use, it became impossible for shipment overseas on account of the large shipping space occupied. At the beginning of the 1914-18 war, the French military authorities used narrow-gauge railways extensively and these were mostly made by the Decauville Company in France, so that the name Decauville became adopted in French army procedure. During that war, the French works were not able to supply sufficient quantities of light-railway material, so that the bulk of such equipment for them, and the British and American armies, was supplied from England and America—as ordinary light-railway equipment—but the description Decauville was still used to cover everything of that kind. Early in this war, the name Decauville was mentioned now and again, principally because reference had been made to the 1914-18 war records; but the name has now gone out of use practically entirely, and this class of equipment is generally called light-railway material. If "Metropolitair" would care to communicate with Robert Hudson Limited, we feel sure that that company would be able to give him any information on this subject for which he is searching.—ED. R.G.]

Publications Received

Locomotives of the North Staffordshire and the London Tilbury & Southend Railways. Compiled by M. C. V. Allchin and obtainable from him at "Glenvale," Portchester Road, Fareham, Hants. 8½ in. x 5½ in., 12 pp., paper cover. Price 1s. 7d., post free.—This booklet is the third in Mr. Allchin's new series of locomotive registers. The information given covers all locomotives in service immediately before the amalgamation. Details given are the wheel arrangement, the builder and building date, the works number, and the running numbers.

The Evolution of Railways (Second Edition, 1943). By Charles E. Lee. *The Railway Gazette*. 108 pp. 9 in. x 6 in. 62 illustrations. Price 6s.—Throughout railway history the number of reliable railway historians has been relatively few, but the present generation is fortunate in having produced a chronicler with such painstaking capacity for research and meticulous insistence on accuracy as Mr. Charles E. Lee. The more so, moreover, as the subject dealt with in this book—the evolution, from the earliest known forms of wheeled transport in human history, of rail transport with flanged wheels—has never undergone previously such careful examination and documentation. It has produced many plausible theories, widely quoted as facts, but little supporting evidence, and by an extensive search of contemporary literature—to which, throughout the book, full reference is given—the author is able to say the last word on many hitherto contentious matters, such as the origin of the 4 ft. 8½ in. gauge, the derivation of such terms as "tram," "tramway," and "sleeper," the first use of flanged wheels (which long preceded the first tramways laid with angle-iron tramplates), and others. It is sufficient for his purpose to lead up to the Stockton & Darlington Railway of 1825 and the Liverpool & Manchester Railway of 1830, and this is where the book ends. Opportunity has been taken in the second edition not merely to increase the size of page and improve the format to something more befitting

the importance of the subject, but also to add over 40 pp. of new matter, including a chapter dealing with the Prior Park wagonway at Bath—the first true railway of which illustrations and a detailed description have survived—and with the early work of Smeaton, and also an admirable index. Mr. Lee is to be congratulated on having produced a book which not only provides most interesting reading, but has every claim to be regarded as the standard work on the subject.

CECIL J. ALLEN

Road Testing Freight Car Trucks.—From the American Steel Foundries of Chicago, U.S.A., we have received a handsome brochure which bears the above title; it contains many illustrations in sepia. The American Steel Foundries has been carrying out railway equipment research and development work for 40 years; the present publication is an account of some of the work being done by the A.S.F. "Service Laboratory." This laboratory is mobile and consists of two special carriages with equipment for providing accurate and detailed observations of goods-wagon bogie performance at operating speeds up to 95 m.p.h. For this purpose one of the carriages is equipped with bogies of known performance, and the other with experimental bogies. Tests have been carried out on several American railway systems; the total number of test runs over a period of 14 months is given as 187, totalling 27,396 miles. The measuring apparatus carried by this mobile laboratory is illustrated and described together with other features of special interest.

The Westinghouse Coded Track Circuit Manual. (1st edition, October, 1943.) 44 pages, 9 in. x 7 in., 21 diagrams, 7 photographs. Published by the Westinghouse Brake & Signal Co. Ltd., Pew Hill House, Chippenham, Wilts.—The invention and development of coded track circuits is one of the outstanding features of signal engineering of recent years. In the United States many interesting signalling installations have been constructed already utilising such track circuits in several different ways, enabling line wires—always liable to derangement in the severe winter weather

met with in parts of America—to be eliminated and longer track circuit sections to be worked without the necessity of subdividing to meet unfavourable ballast conditions. This is particularly advantageous in the circumstances in which many automatic signalling installations are required to function in the U.S.A. and it is not surprising that the code principle is finding increased favour there. The present publication explains the working and application of the different types of coded track circuit and their advantages in a manner which any reader having a general acquaintance with signalling practice can understand without difficulty; the circuits involved in the practical examples illustrated are dealt with in detail, with the aid of well selected and clear diagrams. A useful feature is that these are repeated when necessary, to save the reader from having to turn back to consult a diagram removed from the text he is reading. The manual is excellently produced and forms a most welcome addition to the signal engineer's library, dealing as it does with a type of equipment likely to occupy a prominent place in post-war developments.

WIRE STRAND FOR SIGNALLING PURPOSES.—A revision of British Standard 163A for galvanised steel wire strand for signalling purposes has been published. Experience in the use of the 1936 edition of the specification indicated that amendment was desirable, to provide strand of greater reliability, and several changes have been made. In place of four grades of wire having tensiles which vary from 25 to 90 tons per sq. in., provision is made for three grades of wire. The previous low-tensile 25/30 ton grade has been omitted, and the 40/50 ton grade has been increased in tensile to 50/60 tons. It is stipulated that the manufacturer shall test each coil of wire before stranding. The inspection procedure as to the selection of test samples has been modified to ensure that such samples more adequately represent the bulk. Copies of the specification, price 2s. net, post free, may be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1.

The Scrap Heap

Men and women employees of the London Passenger Transport Board have contributed £22,000 to the Red Cross Penny-a-Week Fund.

A new traffic from the Isle of Wight is represented by tomatoes; and during the 1943 season the Southern Railway brought from Newport nearly 29,000 packages for the North of England.

To the Editor of *The Railway Gazette* Sir,—Does *The Manchester Guardian* really believe that this country is fit for nothing but the journeys of heroes? That is the meaning of the sentence which you quote in the Scrap Heap of December 31.—*Grammian.*

The L.M.S.R. now employs 100 women platelayers. The work includes stripping sleepers, opening out ballast, and assisting in changing sleepers. They also tighten track screws, hoe and weed the running lines, and oil the points. In one gang are two grandmothers.

"It is troubling that British railway equities are known today on the Stock Exchange as "Sleepers," and the fact should be troubling not only to holders of the stock, but to the public at large, which profits daily and hourly by the service which this capital expenditure has provided."—From *"The Railway Stockholder."*

DANGER!

One of the industrial magnates who work for the Government in Washington for a nominal salary of one dollar a year has just received from the Treasury Department a cheque in payment for his services during the past 12 months.

It was accompanied by a printed letter saying: In view of the ever present necessity for guarding against inflation, we are hopeful that you will take immediate steps to invest this dangerous money in War Bonds."—Peterborough in *"The Daily Telegraph."*

Quite a number of our Irish railway engines have the agitated appearance of asthmatic old ladies; yet few, I imagine, are as old as America's most ancient and active *Klamath*, which made its maiden trip in 1868 and is still going strong. Built the previous year, this engine was sent from the Atlantic to the Pacific coast

by way of Cape Horn, to enter the service of the Central Pacific Railway. Up to the turn of the century *Klamath* was the fastest in the Western States, and the first to be fitted with an electric head-lamp. Now, though not as brisk as she used to be, the doyen of American railway engines provides the principal power for a short-line company in California.—*Quidnunc in "The Irish Times."*

The following is a question put by a well-known U.S.A. corporation to applicants for jobs, and which they are allowed 2½ hr. to solve: A train is operated by three men, Smith, Robinson, and Jones, who are fireman, driver, and brakeman, but not respectively. On the same train are three business men of the same names (Jones, Robinson, and Smith). Mr. Robinson lives in Detroit. The brakeman lives halfway between Chicago and Detroit. Mr. Jones earns exactly \$2,000 a year. Mr. Smith beat the fireman at billiards. The brakeman's nearest neighbour, who is one of the business men, earns exactly three times as much as the brakeman, who earns \$1,000 a year. The passenger who is named the same as the brakeman lives in Chicago. Who is the driver?

MILES BY ANY OTHER NAME—

Talking recently with a railway expert, I discovered that our familiar common-or-garden mile emerges in railway statistics in all manner of curious guises. There is, for instance, the ton mile, which indicates the conveyance of one ton for one mile. Then there is the wagon mile, and also the passenger mile, which indicates the transport of one passenger for one mile. Among the largest figures compiled are the total train miles, arrived at by multiplying the total number of trains, empty and full, by the total mileage they have run. Loaded train miles, engine miles, and loaded wagon miles are other examples. Curious, now that I come to think of it, he did not mention the crowded carriage mile. They must have quite a few of those in their records by now.—*"Northerner II" in "The Yorkshire Post."*

The response to the recent appeal by Edward G. Herbert Limited, Manchester, for its Red Cross fund, in connection with the distribution of diaries and catalogues, has enabled the firm already to hand over the sum of fifty guineas.

SIGNAL SERVICE!

A remarkable feature of the Manchester District Superintendent's Department of the L.N.E.R. is the number of women employed in signalboxes in the area in



Photo

[Daily Herald

Mr. and Mrs. Attwood at their signalbox on the L.N.E.R.

unusual circumstances. These include at Ashton (Park Parade) a signalwoman who was also a signalwoman in the last war; a signalwoman on the Sheffield main line whose father is a special class signalman nearby; and two girls running a signalbox at Saughall, near Chester, who have moved from job to job together since their school-days.

The L.N.E.R. now has on its books the extraordinary combination of a man and wife who work different shifts in the same box at Reddish, Manchester. Mrs. Attwood, the wife, was a porter at Reddish Station, and, after passing her signalling examination, she was delighted to find herself posted to fill a vacancy in her husband's box. Though home life to them comes only every third week, Mr. and Mrs. Attwood by detailed timing are able to take care of their 11-year-old daughter and control their domestic life with the utmost composure.

TAILPIECE

(*The four main-line railway companies have appointed an air adviser*)

When British railways first were laid
The traffic of the roads decayed,
For things on hooves could not prevail
Against the new all-conquering rail.

Years later rang from near and far
The challenge of the motor car,
And later was the world aware
Of things that rode upon the air.

But British railways recognise
These are not rivals but allies,
And fitly does the slogan run,
"Communications, they are one!"

So island-wide we see today
Rail, road, sea, air in interplay,
Each feeding each, a common goal,
And each a part of one great whole.

E. C.

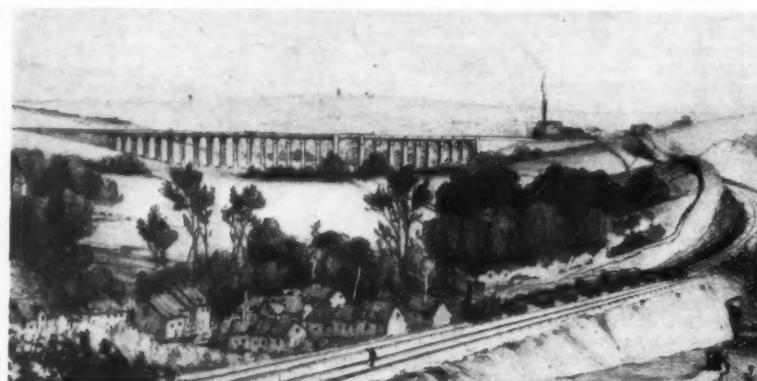


Illustration from a contemporary print showing London Road Viaduct, Brighton, when first completed in 1846. The damage it sustained last May and subsequent repairs are described on page 17. The line shown in the foreground is the original London to Brighton Railway

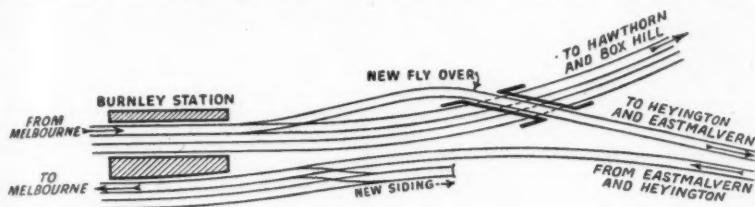
OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

VICTORIA

The Burnley Flyover

A marked improvement during peak periods in the timekeeping of trains on the Box Hill and Eastmalvern lines has quickly demonstrated the value of a new flyover at



Diagrammatic arrangement of new flyover at Burnley Junction, near Melbourne

Burnley, in the east of Melbourne, which was completed in August last. The accompanying sketch plan shows the general arrangement, from which it will be seen that delays are obviated by the segregation of down Eastmalvern (*via* Heyington) trains, which formerly had to cross on the level the up track of the line from Box Hill and Hawthorn to Melbourne. Under the new arrangements, the down trains to Eastmalvern diverge from the Box Hill line, about 250 ft. on the down side of Burnley Station, to a new track which ascends on a gradient of 1 in 40 to cross a bridge 21 ft. above the Box Hill lines. On the other side of the bridge the track descends on a gradient of 1 in 30 to join the former alignment of the down Eastmalvern line about 1,000 ft. on the down side of the Burnley island platform. The flyover crosses the Box Hill line at an angle of about 15 degrees. The bank carrying the new line to the flyover has been confined in part between brick retaining walls.

UNITED STATES

Atlantic Coast Streamliners' Collision

The report has been issued of the Interstate Commerce Commission on a collision which occurred on July 24 last at Milan, North Carolina, between two sections of the Tamiami Champion, the well-known streamline service of the Atlantic Coast Line Railroad between New York and the Florida coast resorts. The collision took place at 4.43 a.m. on a double-track main line which is protected by approach-lighted three-indication automatic block signals of the semaphore type, and an automatic train-stop system of the intermittent

which Train No. 1 had stopped. To avoid delay to Train No. 7, the train dispatcher there instructed Train No. 1 to proceed forwards into a siding, and it was while the latter was moving at a speed of less than 5 m.p.h., that it was run into. Train No. 7 was correctly pulled up by a stop-and-proceed signal 3,044 ft. north of the site of the collision, where the driver duly noted ahead of him the marker tail-lights of Train No. 1, and a lighted fusee which had been dropped by the flagman of No. 1. After standing for 4 min., in accordance with the railway's regulations, the driver of No. 7 proceeded at low speed, prepared to stop, but as a result of fog, steam rising from damped cinders at the coaling station, and electric lights on the station, he overestimated the distance ahead of Train No. 1, and was travelling at about 25 m.p.h. when the collision occurred.

The rear vehicle of Train No. 1, in which four passengers were killed, and seven injured, was practically demolished, and the next coach ahead was slightly damaged;



Sketch map of the railways in the Melbourne neighbourhood, showing position of Burnley Junction on the lines to the east of Flinders Street

the leading diesel unit of No. 7 was severely damaged, and slight injury was sustained by the other two units; five employees were injured. The fireman of No. 7 had been sent to the engine compartment and so was not available as an additional lookout. The report attributes the accident entirely to the failure of the driver of Train No. 7 properly to control the speed of his train in accordance with the signal indication received.

Switch Locking in C.T.C. Territory

The Interstate Commerce Commission recently inquired into an accident which occurred on the Southern Railway System on the single-track section between Bristol, Virginia, and Morristown, Tennessee, at Westburg, Tennessee, on July 17.

A freight train was standing in a siding, with the main track clear, when it was struck head-on by a freight train travelling at speed in the opposite direction, which left the main line and entered the spur; three employees were killed and three injured. The line is controlled by automatic block-signalling, arranged on the absolute-permissive principle and with automatic train-stopping apparatus, and was functioning properly; but the switch giving access to the spur, which was not provided with target or lamp and was hand-operated, and had been set for the main line 5 min. previously, for some reason unexplained was shifted immediately in front of the approaching train. The I.C.C. report therefore recommends that the company should install electric switch-locking at all main-track hand-operated switches in train-control and automatic block-signalling territory.

ARGENTINA

Civil Aviation Development

According to information given in the *Boletin de Aeronautica Civil* for 1942, the year under review was marked by a notable increase in all branches of civil aviation—commercial, tourist, and private. This was due mainly to restrictions on sea travel. Statistics show that the withdrawal of the French and German air lines which formerly connected Argentina with Europe has been more than compensated by the increased services between Argentina and other countries on the American continent. In terms of distance flown within the Argentine frontiers, the commercial air services, both national and international, have increased since 1939 by nearly 40 per cent.; the total distance flown during 1942 was 2,247,335 km. (1,393,595 miles), against 1,604,276 km. (996,255 miles) in 1939. Some figures showing the development of commercial aviation in Argentina during the last ten years were given in *The Railway Gazette* of May 28 last.

GERMANY

Private Railways

As already recorded in *The Railway Gazette*, private railway companies in Germany have tended recently to show improved working results. Among those of which the reports for 1942 have been issued lately are the Regentalbahn A.G. Sitz Viechtach, which showed a considerably-increased net profit (RM. 77,428, against RM. 8,813 for 1941); and the Rinteln-Stadthagen Eisenbahn Gesellschaft, which returned a net profit of RM. 178,000, compared with RM. 142,000 for 1941. The Osterwieck-Wasserlebener Eisenbahn A.G. was able to pay an increased dividend for 1942 (3 per cent., as compared with 2½ per cent. for the preceding year).

Invention and Industry

"Two or three fundamental inventions may well replace in capital wealth the whole of the money that has been spent in this war":—Mr. Oliver Lyttelton

IN his address delivered before the Measurements Section of the Institution of Electrical Engineers, Mr. E. W. Moss, M.I.E.E., the Chairman of the Section, chose for his subject the part played in industry by inventions and the law in relation to inventions. Below is a brief account of his remarks.

Progress in industry is achieved through invention; most inventions are not completely new, but are improvements of existing instruments, machines, processes, and methods. The existence of an industry may depend on the continuance of invention and improvement; Mr. Churchill has recently pointed out that employment and production after the war must be raised to a high level, but this will be possible only if our manufactures are at least as good as those of other nations. Before the war nearly 30 per cent. of imports were paid for by the interest on foreign investments. These investments mostly have been expended in financing the war; payment for imports in the future will have to be made to a greater extent than formerly, by means of manufactured goods. Diminution of the return on foreign investments would probably have taken place, war or no war, because there was a growing tendency for developing countries to find their own capital and start their own industries. Because of this development, it may be much more difficult after the war to sell manufactures. The competition of local industries with their lower labour costs will be keen, and furthermore there will be the handicap of freight charges and tariffs. Invention and improvement in our manufactures is one way, perhaps the only way, by which old markets can be maintained and new markets secured.

Inventions may be divided into two classes, primary and secondary. Primary or basic inventions are few, but each opens up a field for many secondary inventions. A successful instrument, apparatus, machine, or process is rarely produced at first in its final and best form; only by the application to its improvement of other inventive brains does it eventually reach a satisfactory practical form. Engineers must always be inventing, if only to overcome daily problems as they arise. Some inventions are not made to satisfy an immediate need and they do not find ready application, so that the inventor may feel that he has been badly treated. For some inventions to be adopted, the public had to be made to feel a new need; this happened with the telegraph and telephone.

Sometimes practical adoption of an idea has not been possible because manufacturing facilities were not at the time equal to making necessary parts; thus there was no development of the steam engine from the time Hero described it, until the idea was revived by Savery, because nobody could make boilers capable of withstanding a pressure of a few pounds. War tends to accelerate invention, and things are produced regardless of expense which may afterwards have considerable value in peacetime. We can expect to benefit from wartime advances in aviation and wireless; also from the employment of

new and improved materials. The instrument industry has had new insulation materials, new magnetic alloys, and new contacts, all of which have contributed to the production of instruments that are cheaper, sounder in operation, and easier to manufacture.

In a paper entitled "The Evolution of Invention," which he read in 1934, before the Institution of Mechanical Engineers, Dr. H. W. Dickinson suggested that an inventor need not know a great deal about what had been accomplished already in his particular field. Leaders of industry believed sometimes that an inventor should set out with a knowledge of all that has been done before, but in practice such knowledge may keep him from the right line of attack on the ground that this particular line had already been followed by another without success. Generally, it may be better for an inventor to start off on lines of his own and only seek out what has been done by others after he has gone some way in ignorance.

Inventions come into being in several different ways; it may be produced in an instant by a flash of genius or it may be the result of laborious research. Some are produced and brought out in practical form by teams of experts working in well-equipped laboratories and workshops belonging to industry or to research associations. Such inventions often cost thousands of pounds to develop, an amount well beyond the means of most individual inventors.

As Dr. Dickinson pointed out, inventions often have met with opposition from persons who fear that they will upset business or lead to a loss of work. Sometimes inventions have created unemployment, but eventually they have made some article or commodity so much cheaper as to make its use more general, thus bringing about an increase rather than a decrease of employment. Social legislation could provide for the awkward transition period of temporary unemployment by removing the justifiable fears of workers.

Invention can only tend to reduce the price of goods or provide goods which improve the amenities and enjoyment of the people. Within the lifetime of older people, the motorcar, the wireless set, and the cinema have been brought within the reach of most of us. Improvements in transport have made it possible for the worker to live much farther from the place of his employment and yet spend less time in travelling than was required 30 years ago. Furthermore, his journey is more comfortable. It is often said that invention leads to retrogression; that without it there would have been no wars or at least not such terrible ones, but it might still be said that the discovery of metals and the invention of the knife were retrograde steps because they afforded better ways of destroying human life. Can the steel pen, the thermometer, the telescope, spectacles, the incandescent electric lamp, the telephone, rayon, the printing machine, or the cinematograph be considered as making wars easier or more terrible? Inventors cannot ensure that their inventions are readily applied; as Sir Alfred Ewing said in his James Forrest Lecture

of 1928, progress in invention has far outstripped the ethical progress of the race.

The State grants a monopoly for an invention, that is a patent, for a limited number of years in exchange for instruction to the public how to carry out invention, and on payment of certain fees. This kind of monopoly is very different from those granted several hundred years ago by the Sovereign as a reward to favourites or to raise revenue. Such monopolies were granted for the manufacture or sale of things already in existence, so that they deprived the public of something to which it had hitherto had free access. The monopoly afforded by a patent is an encouragement to invention and leads to the manufacture of articles which the public would in all probability not otherwise get. Patent monopolies valid for a limited period were established by the Statute of Monopolies of James I, which was enacted in 1623. This statute has formed the basis for patent laws throughout the world; patents may now be obtained in at least 136 countries. Dr. Dunsheath in his Llewelyn B. Atkinson Memorial Lecture to the Royal Society of Arts this year, said, "Research is established as one of the best long-term financial investments and the profits may be measured as a return on capital several times over." It has been estimated that about £75,000,000 is spent each year in the U.S.A. and about £1,000,000 in this country by the electrical industry alone on research.

Research is carried out by (a) industrial concerns expecting to reap direct benefit from their expenditure; (b) industrial research associations maintained by subscriptions from industry in the expectation of obtaining the benefit; (c) government research institutions working for the benefit of the public generally in some cases and (d) universities and colleges. Many industrial research departments do work which has little relation to the trade interests of the industry concerned; they have been responsible for accumulating much knowledge of purely scientific interest which has been placed at the world's disposal by their publications and by those of their research staff. However, no concern would undertake the expense of research to make discoveries for the benefit of everybody; the chief aim of industrial research is to develop inventions on which it is possible to obtain a patent monopoly. At one time it was felt that patent protection was inadequate and there developed a tendency to reduce expenditure on research. In some industrial research departments the staff may show a regrettable lack of interest in inventions suggested by outside inventors; this narrow policy might be changed with advantage to the concern and to the community.

Research associations such as the Electrical Research Association are doing valuable work and they secure patents, not with the idea of obtaining royalties, but so as to maintain control of their manufacture. In this way, non-subscribers can be prevented from reaping benefits which have been secured at the expense of others.

It has been said that all monopolies should be abolished, but the patent monopoly is an incentive to invention and to the proper development of inventions which in the absence of a monopoly might never be exploited. Monopolies for inventions provide a prize to speculative capital to endeavour to develop new inventions and render them available with their consequent benefit to the community. In the opinion of the author, (Continued on page 15)

Cargo Coal Plants—I

A detailed survey of the principles and installations involved in loading coal on board ship from railway wagons

By J. Dalziel, formerly Assistant Electrical Engineer, L.M.S.R.

COMMERCIAL considerations and questions of service to traders and the public generally affect cargo-coaling plants to a very important extent, whereas they hardly concern locomotive coaling plants. When trade is busy, rapidity of operation is very important and the quantity one plant has to ship may be as great in an hour as the amount to be dealt with in a whole day by the largest locomotive plant. Again, delivery under satisfactory conditions may have to take place from any one plant into ships of many different types with hatches and holds of widely varying dimensions and positions, and degrees of accessibility. If excessive shovel work is to be avoided it may be necessary to deliver bunker coal into positions which are very awkwardly placed indeed. Tidal conditions and variations in the level of ship flotation according to the state of loading also cause great variation in height of delivery.

Wagon Movements

Individual sites also vary considerably and these variations materially affect the kind of plant that can be used. The most satisfactory sites are those which allow the coaling plants to be fed with full wagons and cleared of empty wagons by gravity, but it is seldom possible to perform the whole sequence of operations by gravity alone. Unless steep gradients are used, the movement of the wagons cannot be made speedy enough; on the other hand the use of steep gradients makes the wagons difficult to control. Another factor materially influencing the problem of working wagons on gradients by gravity, is their extremely variable frictional resistance; this may be from as little as 7 lb. to about 45 lb. per ton. The former is that of a wagon, oil-lubricated from an inkwell, or non-spillable type of axlebox with bearings in good condition, and the latter is that of a wagon greased-lubricated with both lubrication and bearings in bad condition. Both wagons are assumed to run on a rail moderately dirty with coal dust.

It is impossible to make a switchback or a series of forward and reverse lines and gradients over which both easy- and stiff-running wagons will run, without causing excessive speed and impact on the one hand while giving the certainty of surmounting the summits of the up gradients on the other.

Mechanical Shipping Appliances

Various methods of shipping coal have been used in this country including principally the familiar wagon hoist cranes, and, of late years, conveyors. Wagon hoists are always hydraulically-operated except, so far as the writer is aware, in one instance at Rothesay Dock, Glasgow, where there are some electric hoists based on hydraulic designs. In one hybrid design an electric hoist of the locomotive coaling type is used to feed the "boom" belt of a conveyor, thereby saving the considerable space taken up by the main belt, but losing by the additional time taken in tipping. There are also other methods, notably on the North-East coast, where the steep banks of estuaries have enabled coal to be discharged direct from wagons into ships' holds through

suitably placed and designed chutes. In some instances such designs have been reproduced on quays where the wagons have been run on high-level tracks and have discharged into the ships through chutes. In most instances these employ bottom-door wagons, but in some the wagons have been end-tipped.

Particularly on the north-east coast where colliery- or railway-owned coaling tracks, or even the collieries themselves, are near water deep enough to take a moderate-sized collier, the gravity system has been in great favour; such coaling docks are called "staithes." Though a very economical system, it is not one which lends itself to any great refinement; there is often excessive breakage at entry into the chutes, in the chutes themselves, and on delivery into the hold.

Objection to breakage is liable to arise at times when the coal trade is slack, though it has been little heard of between these times when the trade has been busy. However, coal is a valuable material which ought to be delivered to the consumer in the best condition possible; it should not contain a large percentage of fine dust, even though that dust be mainly comprised of pure combustible carbon, as it tends to be blown away, and, moreover, in domestic fires, it clogs and does not burn with anything like the freedom of larger material. The breakage problem will continue to be of concern to the trade and to consumers until preventive methods, effective under all normal working conditions, can be adopted in all coal-loading plant, regardless of its type.

It is not proposed to deal in detail with plants of the gravity type as their layout is largely influenced by site. The incorporation in the general layout of such plants of anti-breakage devices necessarily modifies their design and some notes about this are included later. Some plants, mainly of the gravity type, have utilised conveyor belts; chiefly as a means of conveyance rather than of shipment, that is to say, as a substitute for wagon transit, with the object of ensuring a favourable location of rails and tipping gear; the writer has in mind some of the recent plants on the North-East Coast.

Certain gravity-operated devices call for mention as forerunners of the hydraulic hoists about to be described and as embodying machinery even though such machinery is gravity worked. These plants, though of the hoist type, nevertheless depend on its being possible to bring coal to the quayside at a high level. The wagon is run, generally by capstan, on to a lifting and lowering platform or table at its highest level; the weight of the latter, plus that of the wagon is partly counterbalanced through ropes passing over pulleys which are braked.

When the wagon is properly on to the table the brake is released sufficiently to allow it to lower itself; when it reaches an appropriate predetermined point in its downward travel the table is held at the back end, the wagon door is released; the wagon is tipped and emptied into a chute discharging into the ship's hold. The empty wagon is returned to the top position again by the effect of the counterbalance weights; it is then pulled off and

passed down the empty wagon sidings by capstan. There are a number of such hoists working, most of them very old, but though slow and unsuitable for the heaviest wagons of modern times they have done good service. In a few examples where gravity has not been sufficient they have had the assistance of power operation, sometimes by gas or oil engine, occasionally by electric motor.

Hydraulic Boists

The most extensively-used type of coal-shipping plant of recent years, though not the earliest, is the hydraulically-operated hoist. This embodies a lifting platform on to which the full coal wagons are run, then lifted to a height suitable for discharge into a chute. Discharge is effected by that portion of the lifting table carrying the rails being tipped to the requisite angle; the wagons are fitted with end doors to let out the coal. These are secured for rail transit by cotter pins, which are knocked out by a man detailed for the purpose when the wagon reaches the tipping point. The wagon is held from falling into the chute by the rails which carry it being curved upwards to form a retention guard round the wheels. The chute, which may or may not have lengthening pieces, to be added or detached when necessary, is of sufficient length, at its longest, to reach, when at an angle at which the coal will flow freely, somewhat over the centre of the hatch of the ship of largest beam with which it is intended to deal. Smaller boats are loaded by means of a shortened chute, angled more steeply if necessary. The chute is carried from its butt and outer ends so as to provide for variation in height and angle. Operation is sometimes by separate rams or winches and sometimes from the lifting cradle by means of a temporary attachment thereto. The chute is generally pivoted to give fore and aft movement for reducing trimming. As a rule, provision is made for fitting gratings of varying size of opening in the bottom of the chute so that, if desired, dust and fines can be riddled out and discharged via a false bottom into a wagon. Tipping of a wagon takes place according to the position of the butt end; it is under the control of the operator and preferably done in a way to minimise drop and excessive speed of the coal. Doors are fitted at the outer end of the chute by the use of which the flow can be controlled.

In bunkering, when hatches are frequently awkwardly placed and small, it may be necessary to run the coal on to the deck and turn it into the hatches by hand. Sometimes a temporary wooden chute is fitted to these hatches and the hoist chute discharges into this. Generally, the hoist chute is somewhat unhandy in dealing with bunkers, and to complete bunkering it is sometimes necessary to swing the ship.

The hoist is frequently arranged to discharge the empty wagon to a track at higher level than that from which it receives the full one or vice versa; this is one important advantage of hoists as it facilitates gravity shunting.

Accessory Appliances and Operation

As was earlier explained, the speeds required for fast working cannot be obtained from gradients alone. Wagons are therefore generally worked on to the tipping table by a capstan or some equivalent device such as a ram with a multiplying gear. Capstan work which, in skilled hands, can be very fast is

Showed, however, by its rope work, especially in dealing with single wagons over short hauls; it is also uneconomical in man-power. Alternatively, therefore, as it is necessary to provide a turntable to ensure that single-end-door wagons all go on to the hoist with the doors at the right end, a tilting cradle may be incorporated in this turntable so that it may be tilted sharply to throw the wagons quickly on to the hoist. This tilting cradle is operated by a fixed ram working into a cup at either end of the cradle which is also suitably hinged at both ends. This arrangement eliminates rope work, for it allows the wagon to be impelled forward simply by the manipulation of a lever.

Hoists are frequently fed by traversers and are in fact always so fed when of the portable variety. A tilting table is embodied in the traverser; it can be worked from a fixed ram or rams if the hoist is fixed or works from a few definite positions only. Otherwise the ram and its cylinder must be carried by the traverser and fed with pressure water by a flexible hose. Tilting cradles have been fitted to weighing machines also. They can be operated electrically instead of hydraulically if desired, although with less simplicity of construction, except that power supply is simpler in the case of traverser tables carrying their own tilting apparatus.

The wagon is stopped on the hoist table by the upward curvature of its rails aforementioned, and is braked or scotched to prevent it recoiling back off the table. To throw it off the table after tipping and releveling the general practice is to tip the table and lower it again sharply so that the recoil of the wagon, which is then free on the table, throws it off with sufficient impetus to pass it to the down grade of the empty wagon roads. Where the full and empty wagons are dealt with at the same level there is necessarily a short length of track over which both must pass and which cannot be graded in favour of either. A set of spring or loaded points is provided facing the direction of movement of the empties while allowing the "fulls" to run through in the reverse direction. The length of track between these points and the hoists should be as short as possible, as the longer it is the more time will be taken in clearing the empty to allow of the next full coming forward.

Hydraulic hoists may be fixed or portable; the former permit of sidings, accessory plant, and the hoist itself being laid out as a co-ordinated unit with maximum economy and speed of working; the latter, though they have their advantages, particularly as to positioning in relation to ships' holds, involve more movements and are necessarily slower; also, as the traverser track feeding them is generally at quay level, empties at least must be disposed of by capstan. It would be possible, however, by providing a high-level traverser track to overcome this and allow of the disposal of the empties by gravity at the expense of adding a movement to the operation of the hoist and slowing it somewhat. It is customary where, as in most cases, operation is "one-level" to make the traverser double-track so that it carries the full wagon to the hoist and takes back the empty in one "out-and-return" trip; it has, of course, to move to the extent of the centre-to-centre distance of the tracks between receiving the empty wagon off the hoist and feeding on the "full." Otherwise there is no

substantial difference between a fixed and portable plant.

BALANCE-RAM VERSUS BALANCE-WEIGHT HOISTS

In their internal design either fixed or portable hoists may be of one of two main types, classifiable as the balance-ram and balance-weight types respectively. In most designs the amount of pressure water taken per foot of lift is the same whatever be the weight of wagon and coal lifted; in more elaborate designs, however, by the provision of two or more rams the water consumed may be roughly related to the load by admitting it only to such rams as are sufficient to lift the particular wagon being dealt with.

The coal is what may be termed "live load"; it is lifted and thereafter got rid of. The weight of the wagon is partially "live" in that the cradle is taken up, and may on occasion have to descend, empty. The combined weight of the cradle, tipping frame, and rams does not vary, therefore this dead load should be counterbalanced, but as there is no downward drive like in electrically-driven locomotive plants, it can be balanced only partially, leaving a proportion to ensure the descent empty. As indicated there are two methods of doing this.

(A.) In the direct-acting and balancing-ram type the main rams work direct on to the lifting platform and are of length corresponding to the full height of lift; these are generally two in number placed one on each side of the lifting cradle; for balancing, two further rams are provided which are constantly connected to the mains and which give a lifting capacity as nearly equal to the combined weight of the cradle and rams as is consistent with leaving sufficient weight for lowering empty.

(B.) In the balance-weight type the main rams are shorter than the height of lift and of larger diameter than in the other type; they are applied through wire ropes and multiplying gear and generally work downwards to lift, thus partially counterbalancing the dead weights, which are further counterbalanced by balance weights working in guides fixed in the framework of the hoist and likewise connected to the cradle by wire ropes.

All these ropes, like similar ropes on lifts, cranes, etc., require frequent and careful inspection, and lubrication; also they are liable to a large amount of wear and tear. They have to be renewed frequently, which is a job of considerable magnitude having regard to the weights that have to be taken charge of in the process and to the size of the ropes themselves. Direct-acting and balancing rams require attention only at long intervals, but they are liable to wear unevenly, for instance, at points which stand in or work through the glands more than others. This is especially so if, as is sometimes the case, there is a pulsation in the pressure-water supply sufficient to cause a slight dancing movement of the cradle. This is very detrimental to the rams especially at the point where they stand in the glands with the cradle at bottom level. With turbine pumps as used nowadays such pulsation does not generally arise.

When the rams require renewal their weight and length renders this a heavy job particularly as lathes of suitable length of bed may not be easily accessible. The only repair possible short of welding on or otherwise depositing metal on the worn portions of the rams is to turn them down throughout to the dimension of the worn parts and this, of course,

causes some diminution of the lifting capacity of the hoist. The balancing-ram hoist is, however, a much neater and more attractive design than the balance-weight and rope type and it requires these attentions only at infrequent intervals.

A balancing-ram hoist may, of course, embody wire-rope-actuated mechanism for some of its movements and balance-weight types may dispense with some, at least, of the ropes. Hoists such as have been particularly referred to above are made for wagons of up to 20 tons capacity, that is, for a total lifting capacity of 30 tons; the older type of hoist, usually made for wagons of a maximum capacity of 12 tons, generally employed a single central ram with an auxiliary ram for tipping; there was no provision for reducing the consumption of pressure water by balancing of any kind.

ANTI-BREAKAGE DEVICES

Breakage is caused mainly by the fall of the coal from the nose of the chute into the hold but there is also some breakage as the coal falls from the wagon into the top end of the chute. From early days attempts to reduce or prevent breakage have been made by using boxes of up to 5 tons capacity which are supported and held up to the nose of the chute by crane. By means of doors fitted to the chute the coal is held back and allowed to flow into the boxes only gently; when full the boxes are lowered by the crane to the floor of the hold and there emptied in one of various well-known ways, for instance, they may be hung in such a way that they tend to upset and do so if a catch be lifted. Sometimes they are made with bottom doors which are self-opening when the box reaches the coal or the floor of the hold; such devices were described in the articles* on locomotive plants. There are in fact numerous devices differing in detail from each other. The principle of all these is that a heap of coal is piled up so as to diminish the drop of the coal subsequently falling direct from the nose of the chute, providing at the same time for coal to fall on coal, so cushioning the blow that would result from falling direct on to the steel floor of the hold. They are still available on many hoists particularly in South Wales. They slow operation and there is generally an extra charge for their use; they have been largely superseded by the Handcock device.

Of late years complaints of coal breakage have become more definite and urgent, so that other devices have been developed; the most successful and widely used is the Handcock anti-breaker. This is in the form of a vertical escalator which is held up to the nose of the chute by crane and which embodies a series of flats or shelves to receive the coal as it falls from the chute and lower it by the effect of its own weight to the floor of the hold without any serious fall. The flats are held in a more or less horizontal position in the downward passing direction but they rise to clear any obstruction which they may have to pass, including large coal lumps, and travel in the vertical position in the upward or idle direction at the back of the appliance.

This device is in very extensive use and has without doubt materially reduced breakage. It involves providing a heavy crane for handling it and holding it up to the mouth of the chute and it does not of course entirely obviate breakage. Though generally operated as indicated by

* The Railway Gazette, July 9, July 23, and August 6, 1943

the weight of the coal itself (speed being kept within control by an automatic centrifugal brake) it is sometimes driven by an electric motor. This gives the advantage of better speed control and greater certainty of action.

A device recently developed for use with coaling plants of this type is the hydraulically-operated digger. In frosty weather, the coal, more particularly when of a small grade that has been allowed to lie a long time in the wagons, is liable to freeze up to such an extent that it will not run out when the wagons are tipped to the maximum angle that can be given them. In such emergencies it has been necessary to send men on to the hoists in somewhat dangerous and exposed positions to poke the coal and force it to run.

The hydraulic digger, which is an Armstrong-Whitworth product, consists of a flat-plate form of spade or pusher of approximately the width of the wagon, which is lowered into the wagon and is actuated by a cylinder and ram through suitable mechanism so that it sweeps close to the bottom of the tipped wagon and pushes the coal out. The services of the men for poking are thus dispensed with and the men themselves saved from doing somewhat risky work.

Description of a Typical Hoist

It may be useful to give a short description of an hydraulic hoist for which the writer was responsible and which, though put down many years ago, is still fairly typical of a fast-working plant, economical in labour. The hoist was fixed standing on a projecting jetty of ferro-concrete and was of the direct-acting balancing-ram type, with four rams, two of which were constant pressure and the other two for lifting or operating. With these latter rams only in use the capacity was 20 tons. Tipping was done by a rope actuated by a ram fitted with multiplying gear. The tipping-cylinder ram and multiplying gear, however, were so arranged as to give a lift sufficient not only to tip the wagon but, with the admission of pressure water throughout the course of lifting, to enhance the lifting capacity of the hoist. This enhancement enabled it to deal with 20-ton wagons, that is with 30-ton total weight. Otherwise the tipping cylinder was not fed with pressure water until tipping had to be done. It has to be of sufficient capacity to tip a 30-ton wagon but the amount of water taken for tipping in comparison with the total consumption was a small percentage.

Control was effected from the driver's cabin about half-way up the main framing of the hoist; valves, and so on, were of a suitable type with ample-sized water passages for rapid manipulation and movement of the lifting platform, cradle, and other parts. To allow of rapid lowering without the lifting table having to suffer a jolt on reaching the bottom of its travel a timber cushion was provided under the lifting platform, so constructed as to give some spring when the platform engaged with it.

The full-wagon roads consisted of a fan of sidings at a higher level than the hoist, and graded downwards towards it at 1 in 70, to 1 in 90, which is sufficient to permit wagons in good order to move fairly slowly downwards by gravity. The sidings were brought at the hoist end through points, into a single line which led on to the full wagon weighing machine; the gradient was continued through the points and over the length of single line, and the weighing machine.

From the weighing machine the wagons

proceeded on to a turntable fitted with a tilting table, as above described, and thence along a further length of single track past points facing in the opposite direction (for empty-wagon movement and leading to the empty-wagon sidings) to the hoist and the lifting table. The wagons were projected at a high speed on to the latter by the tilting of the turntable rails, as above described, and the empty wagons were thrown off the table in a manner which also has been described, through the points and over a short length of lightly-graded line to the empty weighing machine; thence the gradient of the line was increased; the empty-wagon sidings opened out from the single track beyond the weighing machine into a fan at considerably lower level than the hoist. The wagons could be braked on the weighing machine table and, if necessary, be knocked on by the next oncoming wagon. On the full side it was possible, with the grades mentioned, to hold the line of wagons back by the application of one or more brakes, release allowing the line of wagons to move forward for the leading one to take its place on the full weighing machine.

The gradient on the weighing machine rails was sufficient to allow the wagon to move forward to the turntable on release of its brakes; for making this journey there was available the time taken by the wagon next in front being lifted, tipped, lowered, and discharged empty from the hoist. In case this should, on occasion, prove insufficiently fast, as, for instance, with wagons in bad condition, there were provided jiggers, consisting of a vertical cylinder and ram with multiplying gear, on both the full and empty sides. These could be used to move wagons as and when required. Having no loose ropes and being of short range, they were more convenient than capstans; they may be considered precursors of the fixed-rope capstan which had not then been brought out; in the circumstances they were somewhat more convenient than the later device though, of course, the jigger had not the same long reach. For the purpose of working anti-breakage boxes the hoist was provided with a power-operated crane on each side of the chute lifting respectively 5 and 3 tons so far as can be remembered.

After the hoist was first put to work various anti-breakage boxes were tried, but though partially successful, they were used only on exceptional occasions, probably because of the increased labour involved and their slowing down the speed of operation. This agrees with the writer's experience generally; it would appear that if a plant is to give good results in respect of breakage, the anti-breakage devices must form an integral part of the mechanism and be used always in the course of its operation and not be something separate which can be set aside for special occasions. More recently this hoist was fitted with a Handcock anti-breaker, which required the provision of a much heavier crane. The plant is reputed to have loaded as much as 700 tons an hr. on occasion.

Electrically-Operated Hoists

A set of hoists of similar design to the hydraulic hoist just described but with electric operation was put down in Rothesay Dock, Glasgow, some years ago. The operating features were practically identical with those of an hydraulic hoist of the rope-and-counterbalance-weight type; lifting, lowering, and tipping, and the other accessory operations were done by electric motor-driven winches, the

winding drums of which were stopped and held in place by electrically-operated brakes automatically applied, as on lifts, cranes, and so on.

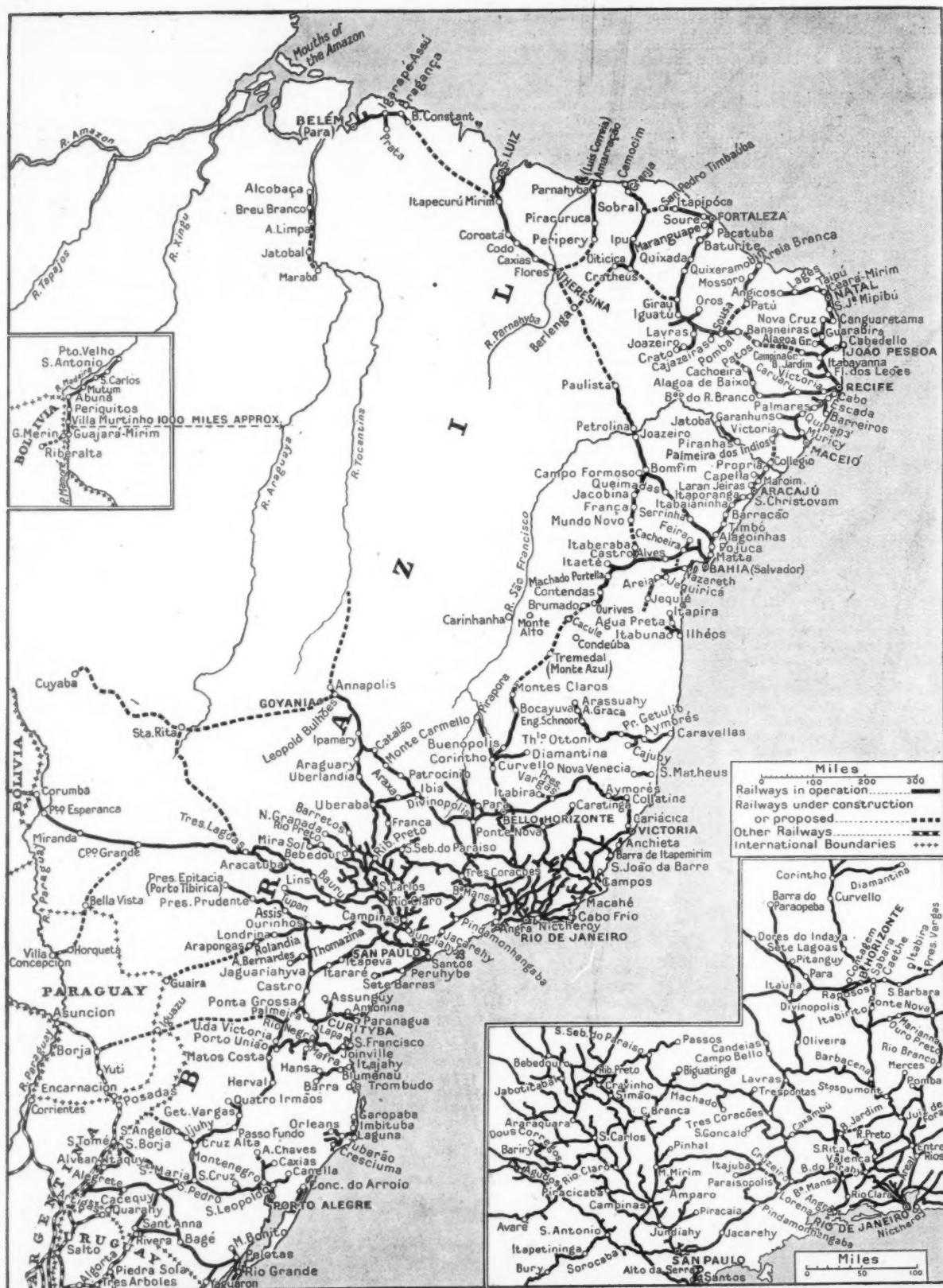
However, operation by rams and multiplying gear as in the hydraulic hoist gives the advantage of quicker and more precise stoppage; cutting off the pressure water supply is a better form of control than brakes; preferable also is lowering under the control of the valve opening to exhaust as compared with lowering under brake power. For the hydraulic hoist, lifting-speed is under the simple control of the valve opening and is limited only by the effect on water flow of pipe sizes and so on; it is thus more flexible. The electric hoists had the further disadvantage of requiring extremely heavy draughts of power from the electric mains to give them speeds comparable with those of hydraulic hoists which in general are able to draw on pressure-water storage in accumulators of simple type.

To equalise the load on the mains arising from these electrically-operated hoists it was necessary to provide nearby a special sub-station embodying flywheel energy storage on the Ilgner system; this must have added considerably to the cost of the installation, as well as to its operating cost. The general power demand on the power company's mains, of course, in these early days was much less than it is nowadays, so that the high-peak demand that had to be dealt with from this plant was correspondingly serious. The writer is not aware if the flywheel storage system is still in use or whether it has become unnecessary by reason of the hoist power demand becoming less significant relatively to the total.

The application of direct electric operation to hoists originally developed for hydraulic operation inevitably involved undue elaboration and complication, and was an example of a "forced" design. At the time, however, no other coaling methods were available equal in speed to hoists; conveyors, to which electricity is better adapted had not arrived. Though it was found possible directly to apply electricity, a better machine and a less elaborate installation would have resulted by using electricity for pumping, and operating hydraulically in the usual way; hydraulic accumulators could have been provided for load equalisation. In the writer's view this would be still the correct procedure in similar circumstances today but, as will be seen later, the electrically-operated conveyor is, according to the writer's view, superior both in its shipping methods and in its suitability for electric operation.

(To be continued)

WASTE PAPER AND MEDICAL SERVICES.—Nearly one ton of waste paper has been used in the manufacture of a consignment of insulation board which is helping in the production of penicillin, the new drug which has saved the lives of many soldiers. The insulation board lines laboratories constructed for the manufacture of the drug, as it is important that there should be no loss of heat when the mould from it is produced is forming. Waste paper also is helping to build the hospitals for our wounded in Italy and North Africa. The huts which are erected quickly as hospitals are lined with building board, which is made partially from waste paper, re-pulped and mixed with wood or cane fibre. To manufacture the building board needed in a hospital for 125 men, five tons of waste paper is needed. The importance of salvaging this material, therefore, needs no emphasis.



The railways of Brazil, showing connecting lines under construction, or proposed, to link the isolated systems based on ports
(See article opposite)

Railway Development in Brazil

A survey of new construction under the supervision of the National Department of Railways

(From our own correspondent)

IN the Central and Southern States of Brazil travel from one interior centre to another is in many cases possible without recourse to coastal shipping, although not in accordance with any well-organised plan. In the north, however, the railway system still consists of independent lines linked only by river or sea-going transport. In peacetime this is mainly a matter of weighing the respective considerations of transhipment or of costly and lengthy railway construction, but in war conditions interior communication is a strategic and economic necessity when there is risk of interruption to maritime transport.

The necessity for a completely unified railway system has always been recognized by the present government, which was responsible for the approval of the first General "Highways" Plan in June, 1934, and for the formation of the National Department of Railways in 1941. The Plan of 1934 did not make the progress expected, as the Treasury grants for new railway construction were invariably consumed in maintenance. The National Department of Railways has made a very decided effort to put an end to this practice and the plans made for 1942 were adhered to faithfully. Grants initially made for that year totalled Cr.\$43,810,000. A further grant of Cr.\$20,000,000 was made in October, 1942, and a final grant of Cr.\$3,000,000 was added. To effect an extensive programme of works 16 sub-commissions were formed to deal with various sections. As a result some 879 km. of preliminary survey, 506 km. of final survey, and 474 km. of location were accomplished.

The main Brazilian trunk line from north to south has its greatest interruption between Montes Claros on the Central Railway and Ourives on the Viação Ferrea Leste Brasileiro. The construction of a railway from the north began at São Felix (near Cachoeira) on December 23, 1881, and took the direction of Carinhanha on the River São Francisco. A distance of 250 km. was completed by November 15, 1888, to Machado Portella, but here the work ceased until 1910 when it was decided to continue the construction as the Estrada de Ferro Central da Bahia from Machado Portella to Monte Alto and Carinhanha, with a branch line via Condeúba to meet a proposed extension of the Central Railway at Tremedal. On the inception of the National Department of Railways, however, it was realised that a revision of all old plans and surveys was necessary, and a route via Caculec has been adopted. The inauguration of the section between Contendas and Ourives took place recently. This is the first portion inaugurated by Brazilian engineers, as the construction of the Estrada de Ferro Central da Bahia up to Machado Portella was undertaken by Englishmen, and the railway from Machado Portella to Contendas was built by the French concessionaires of the Chemin du Fer L'Est Bresilien. At that time earthworks were carried up to Brumado, but these suffered considerably with the passing of time. Nevertheless, once the bridge over the River Contas is completed, this next section up to Brumado will be opened for traffic. This bridge is 200 metres long and has a maxi-

mum span of 80 m., one of the largest spans in Brazil. Between Brumado and Montes Claros there is still a distance of 479 km. to be completed, but here work continues intensively under the joint efforts of the National Department of Railways and the Central Railway, and it was announced recently that this was expected to be completed in March, 1944.

After the completion of this line between Montes Claros and Contendas, there will remain a distance of only 91 km. between Itaberaba and Mundo Novo to be finished to allow of through communication to Joazeiro on the banks of the River São Francisco. Construction on this line was in hand up to 1928 when Itahyba Station (just north of Itaberaba) was opened. In addition, some 6 km. of track at the Mundo Novo end, and 19 km. at the Itaberaba end, were prepared. The latter has now been extended to 30 km. up to Rui Brabosa, but work is delayed awaiting rails. Some 55 km. of track remain to be built.

The railways of the States of Bahia and Sergipe, which may be considered tributaries of the port of Salvador (or Bahia) are also separated on the north by 127 km. between Propriá (on the banks of the River São Francisco) and Palmeira dos Índios on the Great Western Railway. Work on the connecting railway between Collegio (on the opposite bank of the river from Propriá) and Palmeira is proceeding actively, as already recorded in *The Railway Gazette*, and is due to be opened by the beginning of 1944 if sufficient rails can be obtained.

To complete the main trunk line from north to south without passing through the ports, there is yet a distance of 635 km. between Paulista on the Viação Ferrea Leste Brasileiro and Theresina. The proposed railway between these points will have the added importance of making a junction, by means of a branch, with the Estrada de Ferro Sobral at Oiticica. This section is under survey.

The North-Eastern system of railways is formed of various lines connected only by coastwise shipping. The rail terminus at Campina Grande is still some 269 km. distant from the railhead of the Rêde Viação Cearense at Pombal, but at present the National Department of Railways has under construction an extension between Pombal and Patos, a distance of 72 km. The Rêde de Viação Cearense is a system of purely regional importance consisting of two separated trunk lines feeding the ports of Camocim and Fortaleza, to link which will require a junction line between Itapipoca and Sobral. This will facilitate the unification of the two portions of the Rêde Viação Cearense, known respectively as the Estrada de Ferro Sobral to the Estrada de Ferro Baturité. To establish this junction some 94 km. of line require to be built; the first 46 km., from Itapipoca to São Pedro Timbaúba, are already being dealt with under the direction of the National Department of Railways.

The railways of the extreme north of the country were naturally built to serve as feeders to the river transport services of the Amazon and its tributaries. For this reason the Estrada de Ferro Tocantins was planned to avoid the falls of Itaboca and other cataracts and rapids of

the River Tocantins between Alcobaça and Marabá. Construction stopped short, however, in the middle of the Amazon forest without attaining the objective. The National Department of Railways is now completing the line to the river port of Jatobá whence it will be continued to Marabá. Some 12 km. of rails are already laid and a further 13 km. are required to complete the section to Jatobá.

The Madeira-Mamoré Railway was built with the object of connecting the navigable waters of the rivers of the same names and has fulfilled its purpose. In addition to these two small lines, there is the Estrada de Ferro Bragança, subsidiary of the port of Belém, which is to be extended inland.

In addition to work on these links between isolated railways, mention may be made of other new construction. From the port of Caravellas, the Estrada de Ferro Bahia & Minas runs in the direction of Bocayuva on the Central Railway. Up to 1930 some 22 km. of extension had been built from the terminal point of Engenheiro Schnoor (at Km. 532), but then work was suspended and nothing further was done until 1937, when earthworks were completed up to Arassuahy. The rails were laid in August, 1942.

When the National Department of Railways was formed, it was found necessary to modify the location of the trunk line called TP.5 in view of the transfer of the capital of the State of Goiás to Goyania. A branch has been approved from Leopoldo Bulhões (on the E.F. Goiás) to Goyania, of which some 30 km. are already built, and it is intended to extend this eventually to Cuyaba.

This brief survey of development in various parts of the country, so far as concerns the construction of new lines, may be read with advantage in conjunction with the other references to general progress made during the past year in our issues of March 12, 1943 (page 274), May 7 (page 458), September 24 (page 301), and December 31 (page 661).

Inventions and Industry

(Concluded from page 10)

it would be nothing short of disastrous if monopolies for inventions were done away with. Switzerland had no monopoly system for inventions before 1888; a large industrial expansion in that country has taken place since that date. In Holland there was a system of monopolies for inventions up to 1869 when it was abandoned. It was re-introduced in 1912 because no speculative capital would establish new industries and the country was almost a purely agricultural community; since 1912 the industrial progress of Holland has been rapid.

Standardisation has a bearing on invention, for if size or shape be standardised it may have the effect of discouraging inventions which cannot be produced within the allowed space. Thus, a great deal of thought has had to be given to standardisation in industry. The British Standards Institution has issued no less than 1,300 standard specifications. Standardisation has been of great value in providing interchangeability of parts and in cheapening products. However, in view of a possible cramping effect of standards on further invention and development, it would seem advisable that standard specifications should be regularly reviewed to ascertain whether any alteration is desirable to admit of the inclusion of some improvement.

January 7, 1944

Mixed-Traffic 4-8-2 Locomotives, Western Australian Government Railways

A new design with moderate axle loads gives a high rated tractive effort

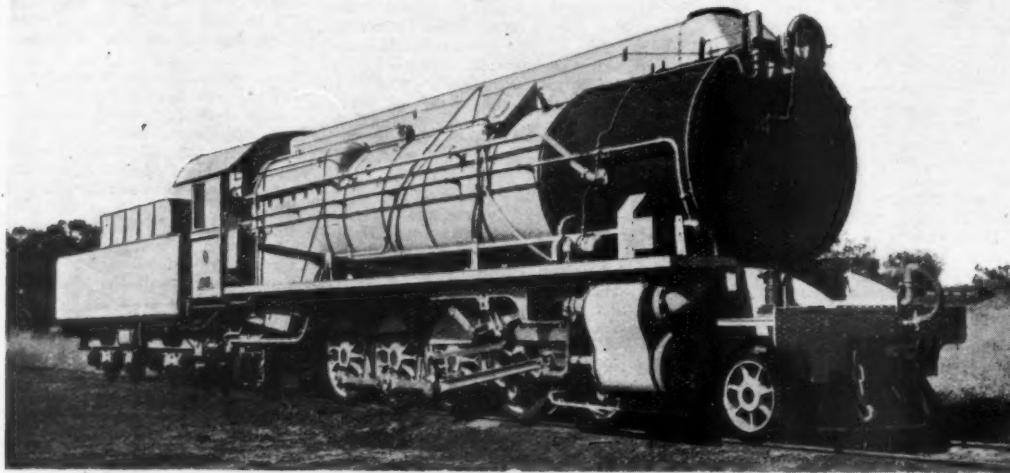
OF ten 4-8-2 type "S" class locomotives under construction at the Midland Junction workshops of the Western Australian Government Railway the first was reported to be complete some time ago; it is shown in the accompanying illustration. These engines are for mixed-traffic work on the 3-ft. 6-in. gauge system of Western Australia, and they will operate for the present on the eastwards route to Coolgardie and Kalgoorlie. Principal particulars are given

firebox and combustion chamber are of steel and two 3-in. outside dia. steel tubes carry the brick arch. Steam is drawn from an internal dry pipe through a 5-in. dia. stop valve to a balanced regulator placed ahead of the superheater header in the smokebox. Fittings include three 3-in. Ross pop safety valves set to blow off at pressures between 205 and 210 lb. per sq. in. The ashpan, which is the hopper variety, is easily cleaned from either side. A Davies & Metcalfe

The leading bogie frame is a steel casting and incorporates the axlebox guides. Side control is by a loaded-spring arrangement

Cylinders, dia.	19 in.
" stroke	24 in.
Piston valves dia.	10 in.
" max. travel	61 in.
Coupled wheels, dia.	4 ft.
Evaporative heating surface, tubes	1,492 sq. ft.
" " firebox	181 sq. ft.
Fire grate area	Total 1,673 sq. ft.
Boiler pressure, per sq. in.	40 sq. in.
Tractional effort (at 85 per cent. boiler pressure)	200 lb.
Adhesive weight	30,685 lb.
Weight of engine in working order	52 tons.
Water capacity of tender	754 tons.
Coal capacity of tender	3,500 gal.
Weight of tender, full	9 tons
Weight of tender, full	44 tons
Total weight of engine and tender	119½ tons

that gives constant resistance. The trailing carrying wheels are arranged on the Cartazzi



General view of mixed traffic locomotive for 3-ft. 6-in. gauge Western Australian Government Railways

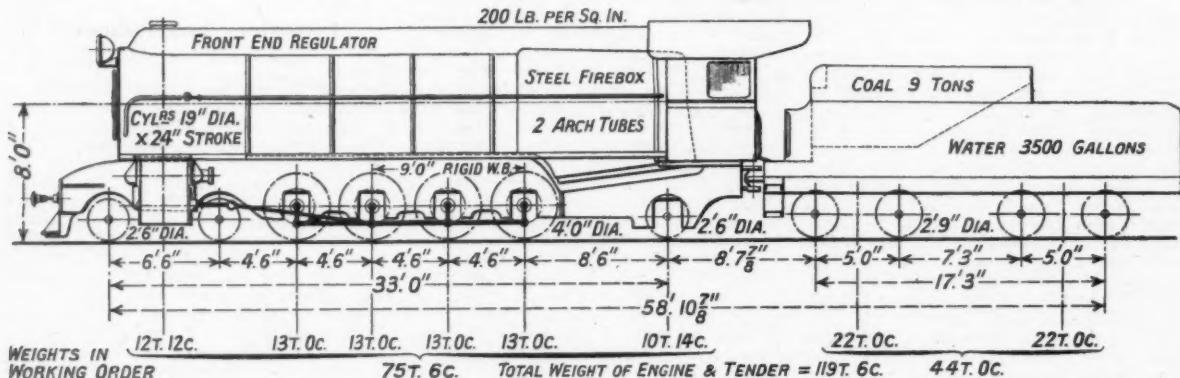


Diagram giving principal dimensions and axle loads

in the table and in the accompanying diagram.

The cylinders, two in number, are provided with inside admission piston valves actuated by Walschaerts gear; lubricant for the cylinders and steamchest is supplied by a two-feed Detroit hydrostatic lubricator fitted with a transfer filler to provide additional capacity for long runs.

The boiler, which has 28 flue tubes of $5\frac{1}{4}$ in. outside dia. for the superheater elements and 93 other tubes of $2\frac{1}{4}$ in. outside dia., is of the Belpaire pattern. The inner

exhaust steam injector is provided on the fireman's side.

Side frames are of plate $1\frac{1}{2}$ in. thick; they are connected below the firebox-throat plate by a substantial steel joint-casting and are rigidly stayed by horizontal and vertical stretcher plates. Combined axlebox guides and frame stays at the coupled wheels are fitted with spring-loaded automatic wedge adjustment. The coupled springs are slung above the axleboxes and are compensated. The coupled axleboxes are oil lubricated from oil boxes placed on the running board.

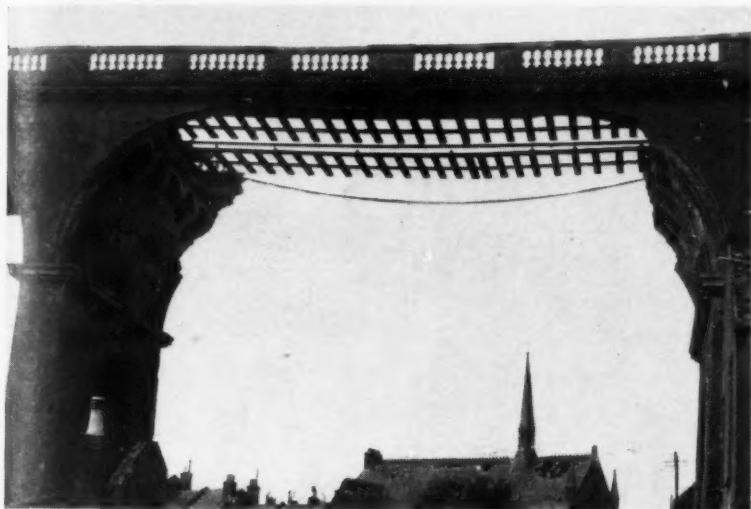
principle. The tender bogie frames, like the engine bogie, are steel castings; the tender underframe and tanks are all welded. A sandbox is carried on top of the boiler; its contents are fed to the front of the leading and main driving wheels. A refinement is Stone's system of electric lighting.

The introduction of the new engines has necessitated the provision of some turntables 70 ft. long; the largest previously in use were 60 ft. long. The new turntables are being made by the Midland Junction workshops for installation at selected points.

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Bombed Viaduct Repairs at Brighton

Two arches and a pier of this 70-ft. high structure were first replaced by steel trestles and spans and then speedily rebuilt under heavy traffic



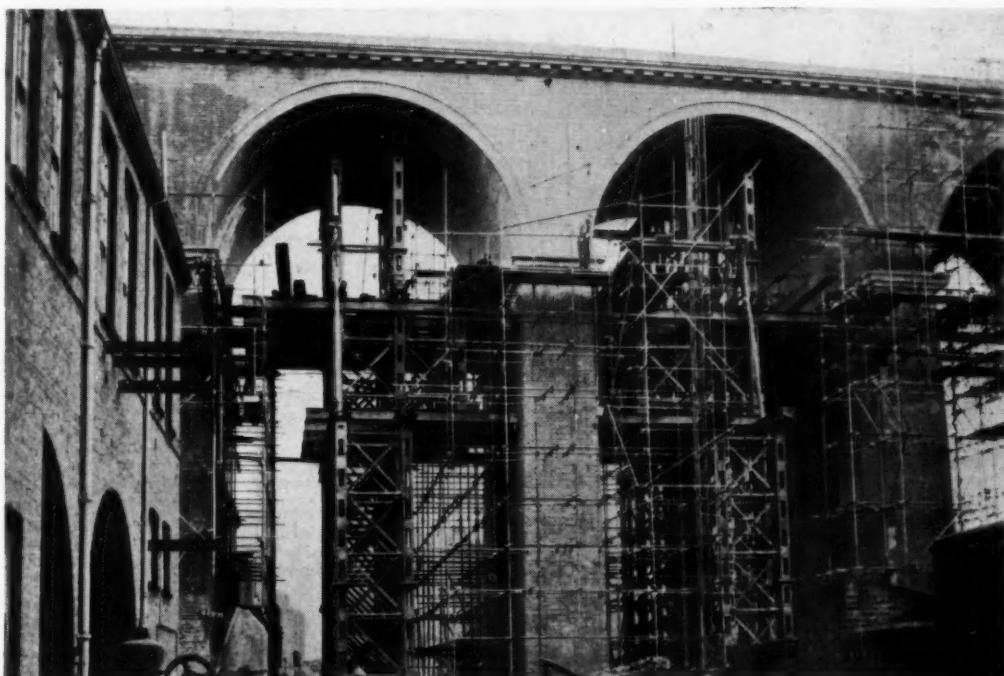
IN the course of a sharp midday tip-and-run raid by enemy aircraft one day last May, damage was sustained by London Road viaduct, Brighton, on the Southern Railway. Like most of the coastal raids about that time, it was delivered by low-flying aircraft, and the bomb causing this damage had already passed through a garden wall over a road and right through a house before it struck No. 7 pier of the viaduct, demolishing it and bringing down the

two adjacent arches. As these arches were each of 30-ft. span, a gap of about 65 ft. resulted in the viaduct, which is 70 ft. high and about 1,000 ft. in length. This viaduct carries a heavy double-line traffic, both steam and electric, between Brighton and Lewes, Newhaven, Eastbourne, Hastings, Tunbridge Wells, and London, via both East Grinstead and Eridge, and the extensive damage so large an engineering work was, therefore, serious. By dint of concentrated

work, however, traffic was restored over a temporary bridge across the gap in five weeks, and in four months the pier and arches were completely rebuilt.

London Road viaduct was built in 1845-46 and was one of Rastrick's masterpieces. Not only was it of great height and length, but the part of it that was breached was constructed on a 10-ch. curve; some 8,000,000 bricks are said to have been used in its erection as it was entirely of brickwork. Like its contemporary, the Ouse viaduct on the main London-Brighton line, this one, spanning an important part of Brighton, has stood up to ever-increasing loadings and finally electric traction, and to a century of wear. Moreover, there could be little better testimony to the soundness of its construction and materials than its resistance to collapse on each side of the gap created by this direct hit by a heavy bomb. The sudden collapse of the two blitzed arches left the adjacent piers without support to withstand thrust from the arches beyond them, but though cracks developed in these two outer arches they did not collapse. Also the ornamental parapet on one side of the viaduct remained self-supported over the 65-ft. gap for some six hours after its supporting arches had collapsed. It then finally gave way, leaving only the two tracks and their conductor rails and some cables spanning the gap.

Repairs were put in hand immediately. The first precaution taken was to insure the stability of the standing piers on each side of the gap by providing tie rods across the adjacent arch spans. Eight 2-in. square rods were readily available and so were used, four for each arch. They terminated with screwed ends passing through washer plates bearing against 14-in. square timber walings placed along the faces of the piers, and were stressed by tightening the nuts with long-handled spanners. To prevent distortion of the arches as a



The rebuilt pier and arches, constructed after the temporary bridge had been brought into use, and completed within about four months of the bombing. The steel trestle work is here being dismantled

result of the stress in the tie rods, the piers were strutted apart by 12-in. x 12-in. timbers. All this work was carried out on tubular steel scaffolding erected in a few hours.

Meanwhile, measures were taken to clear the 1,600 cu. yd. of collapsed masonry lying in the gap, the remains of the demolished pier and arches. Five compressors with suitable drills and other tools were used to break up the larger blocks of masonry into pieces that could be loaded into lorries by a mechanical excavator. The site was cleared within three days.

For the temporary bridging of the gap, steel trestle staging of a standard military type was erected. Its standardised members and interchangeability of parts of comparatively light weight insured rapid erection. The two trestles were bedded on concrete foundations and were spaced so as to allow a new pier to be built between them. They carried a temporary three-span bridge consisting of twelve 18-in. x 8-in. rolled-steel joists forming the 40-ft. clear central span, six joists under each track. Four joists of similar section were used under each track to form the two 20-ft. side spans.

The trestle staging was also used as falsework for placing struts across the gap further to insure the stability of the piers on each side; it was useful later to support the centring for the rebuilding of the arches. The whole of the work entailed in the construction of the temporary steel bridge and the strutting was completed within five weeks of the date of the bombing and, after live-load testing, was opened for passenger traffic at restricted speed.

Work then began on the rebuilding of the pier. Examination showed that the remains of the foundations of the demolished pier would have to be completely reconstructed, and this was



The 70-ft. high steel trestle and girder temporary bridge over the gap, completed in five weeks and here seen under live-load test; two Atlantic "H" class locomotives were used

Steel Trestles lowered four feet to support timber arch centering

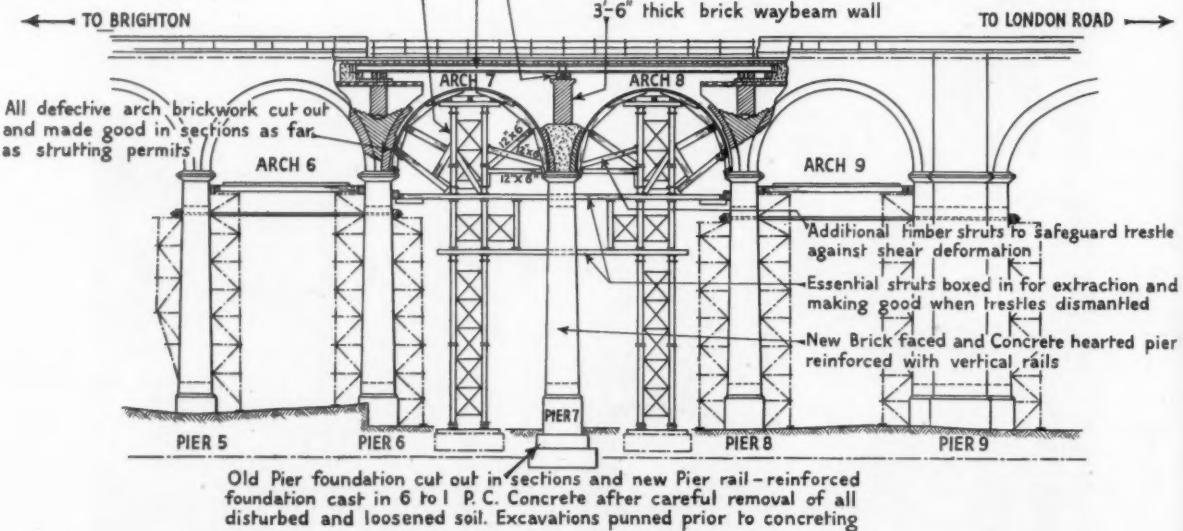


Diagram showing arrangement of staging during reconstruction of arches

quickly taken in hand; rail-reinforced concrete was used.

The original pier was constructed entirely in brickwork, but it was decided to build the new one in concrete encased

in brickwork to match the remainder of the viaduct. The concrete hearting was reinforced with vertical rails. The new arching was subsequently carried out entirely in brickwork.

To enable these arches to be turned, however, it was necessary to remove 4 ft. from the tops of the steel trestles, and utilise the remaining upper sections of

(Continued on page 22)

RAILWAY NEWS SECTION

PERSONAL

The Rt. Hon. Sir Arthur Salter has accepted the invitation of Governor Lehman, Director-General of the United Nations Relief & Rehabilitation Administration, to assist him during the period of organisation of the Administration. Sir Arthur Salter retains his seat in the House of Commons; he has resigned his position as Joint Parliamentary Secretary, Ministry of War Transport.

Mr. A. E. Hammett, M.Inst.T., Assistant Commercial Superintendent, Southern

Railway representative on the Shoreham Harbour Board, and the London Chamber of Commerce.

Mr. S. H. Fisher, M.Inst.T., Assistant Chief Operating Manager, L.M.S.R., who, as recorded in our last week's issue, has been appointed Deputy Chief Operating Manager, was educated at Repton and entered the service of the former L.N.W.R. in 1904. After obtaining experience in the Goods and Traffic Departments, he was appointed Outdoor Assistant to the Superintendent of the Line in 1910. In 1912 he was appointed Assistant to the District

1918, he was transferred to the General Manager's Office, and from that time was associated closely with staff negotiations. On the amalgamation, he was appointed Personal Assistant to the Assistant to the General Manager (Staff & Labour), and in June, 1931, he was made Wages Staff Assistant to the Chief Officer for Labour & Establishment. From 1923 to 1939 Mr. Marchant acted as Assistant to the Railway Companies' Advocate at hearings of the National Wages Board and the Railway Staff National Tribunal, during which period he was also Chairman of a committee responsible for the preparation of



[Modern]

Mr. A. E. Hammett

Appointed Commercial Superintendent,
Southern Railway

**Mr. S. H. Fisher**

Appointed Deputy Chief Operating Manager,
L.M.S.R.

**Mr. S. J. Marchant**

Appointed Principal Assistant to Chief Officer
for Labour & Establishment, L.M.S.R.

Railway, who, as recorded in our December 17 issue, has been appointed Commercial Superintendent, entered the service of the former L.S.W.R. in 1905 at the company's City offices, where he gained experience of all branches of goods, parcels and passenger-train traffics and London cartage working. In 1913 he was transferred to the Claims Office of the London Goods Superintendent, and during 1914-15 was entrusted with the duty of reorganising the company's rope stock to meet the demands of war traffic. In 1916 he occupied the position of Personal Clerk to the London Goods Superintendent, and in 1917 was made District Representative for Goods Station Working. Two years later Mr. Hammett was appointed Outdoor General Assistant to the Goods Manager, and in 1921 was selected for the position of Chief Cartage Assistant. On the amalgamation, he was engaged on special duties in connection with cartage operations, co-ordination, and development. In 1930 he was appointed Deputy Assistant for Road Transport to the Superintendent of Operation, and in the next year he became Assistant for Road Transport. In 1934 he was promoted to the position of Rates & Fares Assistant to the Traffic Manager, and three years later he was appointed Assistant Commercial Superintendent. Mr. Hammett has served as a Member of Council of the Institute of Transport. He is a member of the Road & Rail Conference, and is the Southern

Superintendent at Euston for the Southern District of the L.N.W.R., and in 1919 was made Assistant District Superintendent at Liverpool for the Northern District. In 1922 the Crewe District Goods Manager's District was converted into a Traffic Superintendent's District, and Mr. Fisher was appointed the District Traffic Superintendent there. In 1925 he was appointed Operating Assistant at Crewe to the Chief General Superintendent of the L.M.S.R., which position later was designated Divisional Superintendent of Operation, Western Division. Mr. Fisher was appointed Divisional Superintendent of Operation, Derby, as from June 1, 1929, a position he held until his appointment, in January, 1932, as Operating Assistant to the Chief General Superintendent. Nine months later he became Operating Superintendent, Euston, and in May, 1934, was appointed Assistant Chief Operating Manager.

Mr. S. J. Marchant, Assistant to Chief Officer for Labour & Establishment (Wages), L.M.S.R., who, as recorded in our December 10 issue, has been appointed Principal Assistant to the Chief Officer for Labour & Establishment, entered the service of the former Midland Railway at Leicester in 1901. After a period during which he gained experience of all phases of goods-station work, and during which he also acted as District Relief Clerk, he was appointed Chief Staff Clerk at Leicester in August, 1916. In February,

data for the use of the advocate. He has been Secretary of L.M.S.R. Sectional Councils Nos. 2, 3, 4, and 5 since 1930, and he has been a member of various committees dealing with railway staff matters.

Mr. Archibald Leslie Gibson, whose death we recorded last week, had been Continental Traffic Manager of the London & North Eastern Railway since 1930, and from 1940 held, in addition, the post of Acting Passenger Manager, Southern Area. He entered the service of the former Great Eastern Railway in the General Manager's Office in 1899. Ten years later he was deputed to make a special study of suburban traffic problems, and many of the special measures taken in respect thereof were based on his recommendations. He was engaged subsequently on other investigations, and on various branches of the work of the General Manager's Department, in which he eventually became Principal Assistant. He also took an interest in editing the *Great Eastern Railway Magazine*. During the war of 1914-19 Mr. Gibson was on special duty in Paris; in 1919-20 he was attached to the company's General Agency there. His work took him to various parts of the Continent (he was, indeed, one of the most travelled officers of the L.N.E.R.). On his return to England he was appointed Assistant Continental Traffic Manager, G.E.R.; and in 1924 he became Continental Traffic Manager

(South), L.N.E.R. Six years later he became Continental Traffic Manager for the system, and in 1940, on the retirement of Mr. C. J. Selway, the post of Acting Passenger Manager, Southern Area, was added to his responsibilities.

During fifteen years Mr. Gibson attended meetings of the European Timetable & Through Carriage Conferences, and he visited practically every European capital. He was one of the permanent delegates of the British railways to the annual conferences of the International Union of Railways. He was a member of the special sub-committee of the Rail-

A. L. GIBSON—AN APPRECIATION
An old colleague writes:—

A. L. Gibson was one of those happy people who inspire affection as they pass through life and help to lighten "the weary weight of all this unintelligible world." He often claimed that he was partly of Scottish descent, quoting his names—Archibald Leslie—as proof positive, but whatever his ancestry he had the good humour, forbearance, and thoughtfulness for others which are the birthright of the true citizens of London. He was as proud of the old Great Eastern Railway, on which he started his career, as any

war, was a testimony to his tact and resource in guiding difficult negotiations to a successful issue.

War conditions bear hardly on the passenger departments of our railways. Restricted services and the withdrawal of cheap fares dampen enterprise effectively, although administration problems in plenty remain to be settled. During his three years as Passenger Manager, Southern Area, Mr. Gibson kept his staff in good heart and made the best of his limited opportunities, but it is a pity that we shall never see what he could have done in normal circumstances.



The late Mr. A. L. Gibson

Continental Traffic Manager, L.N.E.R., 1930-43
Acting Passenger Manager, Southern Area, 1940-43



The late Mr. Robert Killin

General Superintendent, Northern Division, L.M.S.R., 1924-32
Formerly Superintendent of the Line, Caledonian Railway

way Clearing House to examine the Conventions of the International Régime of Railways and the International Régime of Maritime Ports; and he was nominated also a member of the permanent sub-committee to report on international railway questions. During Mr. Gibson's period as Continental Traffic Manager, great improvements were made in the Harwich-Hook of Holland service, and weekend cruises from the former port, and through passenger and goods tariffs with Continental stations, were introduced. Mr. Gibson was associated also with the inauguration and development of the Harwich-Zeebrugge train-ferry service. Mr. Gibson was an Officer of the Order of Orange Nassau (Netherlands), a Knight of the Order of Dannebrog (Denmark), and a Chevalier of the Order of the Crown (Belgium).

The funeral took place at St. John's Church, Loughton, on December 30. A list of those who attended is given on page 22.

City man is of his livery company and he had all the Londoner's liking for elaborate ceremonial. He had not worn a morning coat and top hat as a junior clerk in the General Manager's Office at Liverpool Street for nothing!

When Mr. Gibson became Continental Traffic Manager his regard for etiquette found full scope and helped to preserve good relations with foreign railway and shipping companies. His love of music—especially of Bach—was another link with many countries in Europe. He will be remembered longest for his achievements in connection with the Harwich and Humber services. He had an inventive turn of mind and was thinking always of some new device for improving the L.N.E.R. steamships or for developing business. His nimble wit and ready command of persuasive, if sometimes rather flowery, language made him an ideal chairman for a meeting about contentious matters, and a whole series of shipping pools in the "short trades," formulated before the

These notes would not do justice to their subject without a reference to Mr. Gibson's literary style. Before amalgamation he wrote a great deal for the *Great Eastern Railway Magazine*. He also contributed occasionally to the *L.N.E.R. Magazine*, articles which had a distinct flavour from the rest of the journal's contents, for he had a light touch and the fanciful imagination one associates with Bouvierie Street rather than with a railway office. Yet some of his departmental reports might have been taken as models of clean and complete exposition and he had the knack of training his young men to imitate his system. At this time it is a comforting thought that some of his work will endure. (See editorial note, page 1)

We regret to record the death on December 26, in his 74th year, of Mr. Robert Killin, C.B.E., J.P., who was the last Superintendent of the Line of the former Caledonian Railway, and afterwards served as General Superinten-

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dent, Midland Division, and later General Superintendent, Northern Division, L.M.S.R. After his retirement in 1932 Mr. Killin was for a period on the boards of Southhook Potteries Limited, and of Lawrie & Symington Limited, Lanark, and at the time of his death was a Director of the Ailsa Shipbuilding Co. Ltd. Mr. Killin entered the service of the Caledonian Railway in 1882, as an apprentice. In 1897, before his 27th birthday, he became Night Stationmaster at Carlisle. He was appointed Assistant District Superintendent of the Western Division in 1908, and two years later became Superintendent of that division. In 1912 he was made Assistant Superintendent of the Line, and in 1916 he became Superintendent of the Line. He was associated closely with improvements in goods-train operation on the Caledonian Railway. In 1923 he was appointed the first General Superintendent of the Midland Division of the L.M.S.R., but returned to Scotland as General Superintendent of the Northern Division in 1924, and retired from the company's service in 1932. Mr. Killin was Chairman of the Railway Clearing House Superintendents' Conference in 1922. He was made a Commander of the Order of the British Empire in 1918 for his services in connection with transport during the war, and in 1925 he was appointed Justice of the Peace for Lanarkshire.

The funeral was held privately, at his request.

(See editorial note, page 1)

L.M.S.R. APPOINTMENTS

The L.M.S.R. announces the following appointments:

Mr. F. E. Bailey, Assistant (Claims), Chief Commercial Manager's Office, Watford, H.Q., to be District Passenger Manager, Manchester, *vice* Mr. F. H. Cowell, deceased.

Mr. W. B. Carter, District Goods & Passenger Manager, Northampton, to be District Goods & Passenger Manager, Derby, *vice* Mr. J. M. Kirkwood, retiring.

Mr. R. O. Bannister, Temporary General Assistant (Freight), Office of Divisional Superintendent of Operation, Crewe, to be District Goods & Passenger Manager, Northampton.

Mr. P. Wildgoose, Goods Agent, Burnley, to be Goods Agent, Salford, *vice* Mr. F. G. Burgess, retiring.

Mr. T. Dickinson, Goods Agent, Southport, to be Goods Agent, Burnley.

Mr. J. Rigby, Chief Accounts Clerk, District Goods Manager's Office, Warrington, to be Goods Agent, Southport.

Mr. J. W. S. Thomas, Goods Agent, Thornhill, to be Goods Agent, Nuneaton, *vice* Mr. F. G. Elsden, retiring.

Mr. O. P. Ridley, Chief Clerk, Sheffield (Wicker), to be Goods Agent, Barnsley, *vice* Mr. C. V. Thistleton, retiring.

Mr. A. Shaw, Stationmaster & Goods Agent, Millom (also in charge of Green Road), to be Stationmaster, Barking (also in charge of Upney), *vice* Mr. A. Johnson, promoted.

Mr. P. Hetherington, Chief Booking Clerk, Sheffield, to be Passenger Agent, Wigan, *vice* Mr. C. Hincliffe, promoted.

Mr. E. A. Coalhill, Senior Assistant Chemist, Stonebridge Park, to be Chemist, Horwich, *vice* Mr. H. Hayhurst, promoted.

Mr. S. Bairstow, Research Chemist, Stonebridge Park, to be Chemist, Stonebridge Park.

Mr. K. Headlam-Morley has resigned from the position of Deputy-Controller of Chrome Ore, Magnesite & Wolfram, Minis-

try of Supply. He has accepted an honorary consultative appointment with the Iron & Steel Control, and will continue to act as Secretary of the Iron & Steel Institute.

Mr. George Stephens, Chief of Police, Great Western Railway, retired from the Chairmanship of the Police Sub-Committee of the Railway Executive Committee at the end of last month. Mr. Stephens had been Chairman of the Sub-Committee since 1939 and the Railway Executive Committee has recorded its appreciation of the valuable service he has rendered for five eventful years. He has been succeeded by Mr. A. J. White, Chief of Police, London & North Eastern Railway (Southern Area).

Mr. H. F. Loney, O.B.E., whose death we recorded last week, was Chief Goods Manager of the Midland Railway from 1919 until the amalgamation; he then became Divisional Goods Manager, Midland Division, L.M.S.R., but retired at the end of March, 1923. He joined the Midland Railway in 1879 at Brecon. After serving elsewhere on the system he became, in 1891, Coaching Inspector at Leicester. In 1901 he was appointed Assistant to the District Superintendent, Bristol, and from February, 1906, was Acting District Superintendent, Sheffield; in August of that year he was made District Traffic Superintendent for South Wales. In 1914 he became Northern Divisional Outdoor Assistant to the Chief Goods Manager, and, in 1919, Chief Goods Manager.

Mr. H. Gardner, Stationmaster, Grantham, L.N.E.R., has been appointed Stationmaster, Marylebone.

We regret to record the death on December 31, at the age of 85, of Mr. George Thompson Phizackerley, O.B.E., who retired from the position of District Goods Manager, Liverpool & Birkenhead L.N.W.R., at the end of 1921. In 1926 he was appointed a Director of the Liverpool Overhead Railway Company, and held the position of Chairman for a short period before he resigned from the board in 1939.

The following appointments have been made to the board of Robert Stephenson & Hawthorn Limited: Mr. F. S. Whalley, M.C. (Vice-Chairman & Managing Director of the Vulcan Foundry Limited, and a Director of the North British Locomotive Co. Ltd.); Mr. William Lorimer (Chairman & Managing Director of the North British Locomotive Co. Ltd.); and Major-General A. E. Davidson, D.S.O. (a Director of the Vulcan Foundry Limited).

The Minister of War Transport has appointed Mr. E. B. Hugh-Jones, M.C., B.Sc., M.Inst.C.E., to be Divisional Road Engineer for the Wales & Monmouth Division, in place of Major S. Evans, M.Inst.C.E., F.R.I.B.A., who has retired.

Mr. A. C. Morrell, M.C., who is a Member of the Mersey Docks & Harbour Board, has been elected Chairman of the British & Foreign Marine Insurance Co. Ltd., of which he was Deputy-Chairman.

Mr. A. E. Parkinson, Vice-Chairman of Sir Lindsay Parkinson & Co. Ltd., has been appointed Chairman, in succession to the late Lt.-Colonel G. W. Parkinson.

The New Year Honours List

Among the honours announced in the New Year list were the following of transport and industrial interest:

Baron

Sir Thomas Royden, Bt., C.H., Chairman, London Midland & Scottish Railway Company. For public services.

Privy Councillors

Mr. Ralph Assheton, M.P., Parliamentary Secretary, Ministry of Supply, 1942-43.

Captain Charles Waterhouse, M.C., M.P., Parliamentary Secretary, Board of Trade, since 1941.

Knights Bachelor

Mr. Patrick Ashley Cooper, lately Director-General of Finance, Ministry of Supply. Member of the London Passenger Transport Board.

Mr. John Montague Eddy, C.B.E., Deputy Chairman, Prisoners of War Department, Joint War Organisation of the British Red Cross Society and Order of St. John. Chairman of the Buenos Ayres Great Southern and Buenos Ayres Western Railways, and a Director of the Buenos Ayres & Pacific Railway.

Mr. John Gibb Nicholson, Deputy Chairman, Imperial Chemical Industries Limited.

Mr. Adolph Harry Railton, D.Eng., M.I.E.E., Chairman & Joint Managing Director, General Electric Co. Ltd.

Mr. Thomas Somerset, M.P., Chairman, Northern Counties Committee, London Midland & Scottish Railway. For public services in Northern Ireland.

C.B. (Civil Division)

Mr. Percy Norman Harvey, Director of Statistics & Intelligence, Ministry of War Transport.

Mr. George Lawrence Watkinson, M.C., Under-Secretary, Board of Trade.

C.M.G.

Mr. John Victor Thomas Woolrych Tait Perowne, Head of the South American Department of the Foreign Office.

Mr. Herbert James Symington, K.C., Montreal, P.Q., Power Controller, and President, Trans-Canada Air Lines, and a Director, Canadian National Railways.

C.I.E.

Mr. Jasper Fellowes Crofts Reynolds, M.C., Agent & General Manager, South Indian Railway, Trichinopoly.

Mr. Hubert George Salmond, A.M.Inst.C.E., A.C.G.I., Chief Government Inspector of Railways.

Mr. Alexander MacLeod Robertson, M.C., Chief Mechanical Engineer, Bengal Nagpur Railway.

Mr. Robert William Fitzmaurice Butterfield, Financial Adviser & Chief Accounts Officer, Bombay, Baroda & Central India Railway, Bombay.

G.C.V.O.

The Hon. Sir Arthur Stanley, G.B.E., C.B.E., M.V.O. Sir Arthur Stanley is a Director of the Buenos Ayres & Pacific, Argentine Great Western, and Villa Maria & Rufino Railways.

K.C.V.O.

Brig.-General Sir Harold Hartley, C.B.E., F.R.S., M.C., Member of the Managing Committee, Railway Research Service; Vice-President, London Midland & Scottish Railway.

G.B.E.

Mr. Harry Ireland, late Stationmaster, Kings Cross, L.N.E.R.

M.V.O. (Fifth Class)

The Rt. Hon. Sir (James) Arthur Salter, K.C.B., M.P., lately Joint Parlia-

mentary Secretary, Ministry of War Transport.

K.B.E.

Mr. George Wilfred Turner, C.B., Joint Second Secretary, Ministry of Supply.

C.B.E.

Mr. Wallace Alan Akers, a Director of Research, Department of Scientific & Industrial Research.

Mr. Albert Allan, General Manager, Sierra Leone Railway.

Mr. Wilfrid Gagnon, Outremont, P.Q., President, Quebec Shipyards Limited, and a Director, Canadian National Railways.

Mr. William Henry Glanville, D.Sc., M.Inst.C.E., a Director of Research, Department of Scientific & Industrial Research.

Mr. William Merton Neal, Montreal, P.Q., Vice-President, Canadian Pacific Railway Company. Valuable services in connection with war transport.

Mr. Hubert Kennett Purcell, O.B.E., Chief Clerk, Crown Agents for the Colonies.

Mr. Norman Burdett Walton, Montreal, P.Q., Vice-President, Canadian National Railways. Valuable services in connection with war transport.

Mr. Herbert Martin Woodhams, Director & General Manager, Sir W. G. Armstrong Whitworth Aircraft Limited.

O.B.E.

Mr. J. R. Farquharson, A.M.Inst.C.E., Chief Engineer, Tanganyika Territory Railways.

Mr. S. R. Geary, Operating Manager (Central Buses), L.P.T.B.

Mr. T. A. E. Holdengarde, Chairman of the National Industrial Council for the Iron & Steel Manufacturing & Engineering Industries of Southern Rhodesia.

Mr. W. M. McGregor, Chief Controller of Stores, North Western Railway, India.

Mr. J. L. M. Moore, Railway Employment Inspector, Ministry of War Transport.

Mr. J. D. Michael, Secretary to the Railway Board, Government of India.

Mr. L. P. Parker, Locomotive Running Superintendent (Eastern Section), Southern Area, L.N.E.R.

M.B.E.

Mr. L. G. Bird, Chief Foreman, Erecting Shop, Crewe Locomotive Works, L.M.S.R.

Mr. H. J. Bolsom, Chief Storekeeper, Tanganyika Territory Railways.

Mr. C. J. Chaplin, Acting District Engineer, Derby Southern District, L.M.S.R.

Mrs. I. E. Denman, Higher Clerical Officer, Ministry of War Transport.

Mr. A. J. Elmes, Assistant to General Manager, Southern Railway.

Mr. H. R. L. Emery, Honorary Assistant Traffic Superintendent & Station Superintendent, Moghalserai.

Mr. P. F. Finnigan, Assistant Commercial Officer, North Western Railway, Karachi.

Major J. Gold, I.E., Works Manager, Engineering Workshops, Madras & Southern Mahratta Railway, Arkonam.

Mr. W. E. Hocking, Chief Staff Officer, Ministry of War Transport.

Mr. D. McAlpine, Resident Engineer, Oudh & Tirhoot Railway, Mansi.

Mr. T. McIntyre, Officiating Deputy Chief Engineer, Bridges, Bengal & Assam Railway, Calcutta.

Mr. J. P. Maitland, Running Shed Superintendent, Southern Railway.

Mr. F. C. Margetts, Trains Assistant to Superintendent, Southern Area, L.N.E.R.

Mr. C. W. Pepper, Chief of Rolling Stock Section, Southern Railway.

Mr. R. K. Polwhele, District Traffic Superintendent, Oudh & Tirhoot Railway, Sonepore.

Mr. J. Rankin, Stationmaster, Glasgow Central. For services in connection with the movement of overseas troops.

Mr. J. Ridd, Superintendent-in-Charge, South Wales Docks Police Division, Great Western Railway.

Mr. A. M. Smith, Pilot, Harbours Department, Kenya & Uganda Railways & Harbours Administration.

Mr. G. Smith, Assistant Traffic Officer, Marylebone, L.N.E.R.

Mr. R. Veale, Manager, Block Signal Workshops, Howrah.

Mr. J. R. C. Williams, Stationmaster, Paddington, Great Western Railway.

Mr. T. C. Wynne, Assistant Traffic Manager, Nagpur Division, Great Indian Peninsula Railway.

FUNERAL OF MR. A. L. GIBSON

The funeral of Mr. A. L. Gibson, a biography of whom appears on page 19, took place at St. John's Church, Loughton, on December 30. Among those who attended, in addition to family mourners and relatives, were:—

Representing the L.N.E.R.:—

Messrs. V. M. Barrington-Ward, Assistant General Manager (Operating); C. K. Bird, Goods Manager, Southern Area; M. A. Cameron, Passenger Manager, Scottish Area (also representing Passenger Manager, North Eastern Area); F. W. Carr, Mechanical Engineer, Stratford; O. H. Corble, Assistant General Manager (Ancillary Services) (also representing Sir Charles Newton, Chief General Manager); C. G. G. Dandridge, Advertising Manager, and Assistant Passenger Manager, Southern Area; Captain R. Davis, Marine Superintendent; Messrs. R. Gamble, Assistant London Suburban District Goods Manager; J. G. Gilbert, Estate Surveyor's Department, Peterborough; F. Goodrige, Assistant Advertising Manager; H. Hancock (representing Superintendent, Eastern Section, Southern Area); F. E. Harrison, Assistant Chief Engineer; C. P. Hopkins, Assistant to Chief General Manager; C. H. Keep, Assistant Marine Superintendent; F. A. Layton, Assistant to Passenger Manager (also Assistant to Chairman, R.E.C. Passenger Committee); F. Lockwood, London Cartage Manager; G. Mills, Divisional General Manager, Southern Area (also representing Sir Ronald Matthews, Chairman); L. J. Moorcock, London District Passenger Manager; G. A. Musgrave, Locomotive Running Superintendent, Western Section, Southern Area; L. H. K. Neil, London City Manager; L. P. Parker, Locomotive Running Superintendent, Eastern Section, Southern Area; R. T. Phillips, Chief Outdoor Representative, London City Manager's Department; E. E. Porter, Passenger Agent, Kings Cross; E. W. Rostern, Superintendent, Southern Area; F. H. Sedgwick (also representing Chief Accountant); C. M. Stedman, Locomotive Running Superintendent, North Eastern Area (also representing the Divisional General Manager and officers of that area); J. C. L. Train, Chief Engineer; and A. J. White, Chief of Police, Southern Area.

Messrs. V. C. Fordham, late Divisional General Manager's Department, Southern Area; E. G. Low, late Chief Accountant's Department; F. J. McClean, late Accountant's Department; F. Rolfe, late Divisional General Manager's Department, Southern Area; J. E. Sharpe, late Assistant Superintendent, Eastern Section, Southern Area; and G. F. Thurston, late Divisional General Manager, Southern Area.

G.W.R.:—

Messrs. C. Furber, Mineral Traffic Manager & Development Agent; G. E. Orton, Commercial Assistant to the Superintendent of the Line & Public Relations Officer; and A. Maynard, late Chief Goods Manager.

L.M.S.R.:—

Messrs. C. Johnstone, Assistant Chief Commercial Manager (Passenger) (representing the L.M.S.R.); H. W. Phillips, late Vice-President's

Office; and H. G. Williams, Secretary, Continental Traffic Managers' Committee (also representing Mr. A. Evans, Assistant for Overseas & Continental Traffic, Euston).

Southern Railway:—

Messrs. H. J. Bourn and S. J. Grant, Continental Department; R. H. Hacker, Continental Superintendent; W. M. Perts, Commercial Superintendent (and Chairman, R.F.C. Passenger Committee); and H. E. O. Wheeler, Deputy Traffic Manager (also representing Mr. R. M. T. Richards, Traffic Manager).

Representing the L.P.T.B.:—

Mr. A. B. B. Valentine, Chief Supplies Officer, London Passenger Transport Board.

Others present:—

Messrs. A. H. K. Aldred, Secretary, Continental Rail & Water Carriers Conference; C. A. Ellery, Acting Manager, Travel & Industrial Development Association of Great Britain & Ireland; V. D. Fay, Secretary, Dean & Dawson Limited; A. J. Foale, Railway Clearing House; F. J. Gerson, F. J. Gerson & Co. Ltd.; Major-General D. H. Grey, W. H. Müller & Co. Ltd.; O. Holdthuusen, Managing Director, United Shipping Co. Ltd. (also representing United Shipping Co. Ltd. of Denmark); Prof. E. R. Hondekind, Chairman, Inter-Allied Inland Transport Committee; Mr. E. Huskisson, Director & General Manager, Thos. Cook & Sons Ltd.; Comte Jean de Kerdrel, Managing Director, French Railways (London); Messrs. R. K. Leeper, Managing Director, Lep Transport Limited; A. Mertz, Delegate, Belgian Railways & Marine; A. Newbold, late British Railways Agent, Paris; J. Noest, W. H. Müller & Co. Ltd.; E. E. Painter, late Secretary, Railway Clearing House; H. T. Parkin, Director, Crowe & Co. (London) Ltd. (also representing Mr. H. A. Crowe); G. A. Perry, Managing Director, British Commercial Transport Co. Ltd.; C. H. Pickett, General Manager, Eastern National Omnibus Co. Ltd. (also representing Sir Frederick Heaton); F. J. C. Piper, Railway Clearing House; F. H. Reid (also representing Mr. H. E. Pollard, E. Pollard & Co. Ltd.); W. J. Sedcole, Pullman Car Co. Ltd. (also representing Mr. G. H. Griffiths, General Manager, Pullman Car Co. Ltd.); Captain C. E. R. Sherrington, Secretary, Railway Research Service; Colonel K. R. N. Speir, Secretary, Transportation Club; Mr. A. Thomson, of "Transalt"; Mr. Wheeler (representing Mr. H. S. Holden, Chairman, Ellerman's Wilson Line Limited); and Mr. C. Whitworth, Railway Research Service.

Bombed Viaduct Repairs at Brighton (concluded from page 18)

them to support the centring for the arches. This was accomplished by rebuilding the temporary steel bridge as a two-span instead of the former three-span structure, the two new 32-ft. (clear) spans being centrally supported on an extension of the now-completed new pier. These two new temporary spans each consisted of twelve 18-in. x 8-in. joists, six under each track.

Within four months of the bombing, the arches were completed, and, except for the fact that at present a temporary hand rail is in use in place of the ornamental parapet, the new work is distinguishable from the old only in the newness of the brickwork.

The great majority of this excellent reconstruction work was carried out by the Southern Railway's own staff and under the supervision of the company's Chief Engineer, Mr. George Ellison, who retires at the end of January. An editorial in this issue draws attention to the excellence of both the original and new workmanship and materials and to the ingenuity of the engineers responsible for the temporary and permanent new works. An illustration on the Scrap Heap page shows this viaduct as it appeared to the artist in 1846, the year of its completion.

TRANSPORT SERVICES AND THE WAR—223

Spare-Time Railway Help

In a recent week no fewer than 2,246 members of the public, of whom 361 were women, went to L.M.S.R. goods depots to help load and unload merchandise and war freights. In addition to sacrificing their evening leisure hours, they also give up their Sundays to this vital work. The time worked in a week is equal to that of 700 regular 48-hr.-week staff. Where possible the workers are teamed into gangs working under an experienced railwayman.

In one week in the Birmingham area alone, spare timers put in 1,468 day hours and 192 Sunday hours dealing with passenger and parcels traffic.

Spare-time workers are also to be found in L.M.S.R. engine sheds, where 2,119 volunteers cleaned engines during a recent weekend.

L.N.E.R. Train Service Alterations

Certain important train service alterations were made effective by the London & North Eastern Railway from December 6. The 4.40 p.m. express from Liverpool Street is run in two sections daily, the first, at 4.32 p.m., to Bishop's Stortford, Cambridge, Newmarket, and Bury St. Edmunds, and the second to Hunstanton, running from Cambridge onwards 6 min. later than the previous times. The 10 a.m. from Liverpool Street to Norwich is retimed to arrive at Norwich Thorpe at 1.30 p.m., 10 min. later than before, and at Yarmouth South Town at 2.32 p.m., 6 min. later. On Mondays the 8 a.m. from Grantham to Kings Cross is relieved by a new 8.35 a.m. from Peterborough, calling at the same stations and reaching Kings Cross at 10.38 a.m. The 11.30 a.m. from Cambridge to Kings Cross starts at 12.30 p.m., and a new train from Letchworth at 12.26 p.m. takes up the previous working between Letchworth and Kings Cross. On Saturdays the 3.50 p.m. from Liverpool Street to Cambridge runs through to St. Ives. A new train leaves Liverpool Street daily at 6.45 a.m. for Romford and stations to Witham.

In Scotland a new train is run from Carlisle to Newcastle-on-Tyne and intermediate stations at 6.15 p.m.; this service is provided by railcar. A number of local trains that are run chiefly for the benefit of schoolchildren are to be suspended for various periods to correspond with school holidays in the districts concerned.

Parkgate & Aldwarke station, between Sheffield and Doncaster, and Middlewood, on the Macclesfield branch, are closed on Sundays.

L.M.S.R. Train Service Alterations

On Sundays from January 9 the L.M.S.R. is running a new train from Glasgow (Central) at 9.35 a.m. and Edinburgh (Princes Street) at 9.40 a.m. to Birmingham, calling at Motherwell, Carstairs, Beattock, Lockerbie, Carlisle, Crewe, Stafford, Wolverhampton, and Dudley Port, and reaching Birmingham (New Street) at 5.33 p.m. From the same date the 10 a.m. from Glasgow (Central) to Euston ceases to call at Stafford. The 9.40 a.m. from Liverpool (Exchange) to Glasgow calls daily at Lancaster at 11.6 a.m. On Saturdays the 9.50 a.m. from Manchester (Victoria) to Barrow is extended to Whitehaven and Workington, arriving at 3.38 p.m., and a return train is run at 8.8 p.m. from Workington, calling at all stations and reaching Barrow at 10.27 p.m. To accommodate increased workmen's traffic, additional trains are run between Glasgow (St. Enoch) and Hillington.

Fishguard Sailings Suspended

The G.W.R. has given notice that after January 14, 1944, passenger services between Rosslare and Fishguard, and between Waterford and Fishguard, will be withdrawn. Passengers holding return halves of tickets routed via Rosslare or via Waterford will be permitted on and from January 15, to travel via Dublin, Dun Laoghaire, and Holyhead, within the availability of the tickets held, without extra charge, provided they are in possession of L.M.S.R. sailing tickets.

Further French Fares Increase

The Paris radio has announced an increase of 25 per cent. in the price of railway tickets for passenger trains, to become effective on January 10.

U.S. Railway Troops Commanded

General Patton recently commanded the U.S. Army 727th Railway Operating Battalion for exceptional speed and efficiency under fire in putting into service the railway at Licata and elsewhere in Sicily. Within four hours of landing behind the assault wave, they had steam up in a captured locomotive. Also—to quote the General—"Opening of rail lines

and organisation of Italian railroad personnel were made so rapidly that rail service was immediately available in the port of Palermo when it opened on July 28."

New South Wales Railways in 1942-43

During the year ended June 30, 1943, the administration of the New South Wales Government Railways was able to co-operate with the Australian Commonwealth Government in a number of respects in connection with the war effort. Many railway works for defence purposes were undertaken; sites on railway land were made available for Service stores and depots; and much work was performed for Commonwealth authorities and for contractors handling defence orders in drawing offices, research laboratories, workshops, the tarpaulin factory, and in the aircraft, tank, shell, and tool annexes of the Department. Over 3,000 employees were engaged on these works; and, at the end of the financial year, 4,193 railway officers were serving in the Armed Forces.

As from March 3, 1943, the Government Railways were proclaimed a "protected undertaking" under the National Security (Manpower) Regulations. Special measures were taken to overcome the difficult position as to staff created by the prevailing manpower shortage. Working hours generally were extended, in many cases to the limits permitted under the Regulations, and annual leave was limited to two weeks a year, the balance of leave due to employees to be accumulated for clearance at a later date. Where practicable, women are employed; at the close of the financial year, 803 women held posts formerly occupied by males.

In conformity with the desire of the Commonwealth Government to conserve coal and manpower, the restrictions existing on travel within the State were continued; and further reductions in services were made in October, 1942, on the Illawarra line to Wollongong, on the South to Goulburn, on the West of Lithgow, and on the North to Singleton. During the year, 36,674 main-line mail and passenger trains were run, a decrease of 5,221 compared with the preceding similar period. On branch-line services the number of trains was reduced from 37,164 to 28,686, a decrease of 8,478. On the other hand, there was a considerable increase in the number of passenger journeys.

In his report to Parliament on the work-



A German transport column of light horse-drawn vehicles with pulley-type wheels moving across the Pripyat Marshes on a wooden railway. The Germans are reported to have made extensive use of wooden rails, particularly on the northern part of the Russian front. The present view may be compared with that reproduced in our issue of March 5, 1943, page 250, showing gun-carrying trolleys on the Volkov front between Leningrad and Lake Ilmen.



Goods train near Tobruk on the Western Desert Railway being handled by War Department double-bogie American diesel locomotives Nos. 1213 and 1219. Steam traction is now confined to the section from Alexandria to Mersa Matrouh, and diesel traction used between Similla Junction and Tobruk.

ing of the N.S.W.G.R. during the period under review, the Commissioner for Railways commented adversely on the manner in which the travel-permit system for interstate passengers was being implemented. He was of opinion that it was unnecessarily restrictive and irksome, and he favoured modifications to permit of passengers who had good reasons for travel being allowed to occupy vacant seats and berths on interstate trains. During the three months April, May, and June, 1943, there were 8,954 vacancies on the two interstate trains running daily from Sydney to Albury, and 3,030 vacancies in the reverse direction. Had the permit system been more elastic, some thousands of additional passengers could have been carried without the use of extra locomotive power or carriages.

Eagle Airlines, U.S.A.

Application has been made to the Civil Aeronautics Board of the United States by a new corporation, organised jointly by the Missouri Pacific Lines and Texas & Pacific Railway, for authority to handle airborne traffic over a 6,000-mile network paralleling the main traffic arteries of the two systems concerned. Sixteen primary routes are proposed, as follow: St. Louis—Kansas City—Pueblo; St. Louis—Texarkana—San Antonio—Laredo (Mexican frontier); New Orleans—Shreveport—Dallas—Fort Worth—El Paso; New Orleans—Houston—Brownsville (Mexican frontier); Omaha—Kansas City—Joplin—Texarkana—Shreveport; Kansas City—Coffeyville—Little Rock; Memphis—Wichita—Great Bend; Jefferson City—Joplin; Memphis—Little Rock—Hot Springs; Poplar Bluff—Memphis—Monroe; Little Rock—Monroe—Lake Charles; Texarkana—Fort Worth; Palestine—Houston—Galveston—Freeport; Fort Worth—Houston; San Antonio—Corpus Christi; and Monahans—Hobbs. Four basic types of through co-ordinated service are proposed—air-highway, air-highway-rail, air-rail, and feeder service to and from connections with other carriers, and, fifth, local and through air service. The aim of the new organisation, Eagle Airlines, is not to be competitive, but to supplement existing rail and highway service, and especially in view of the increasing air-mindedness of the travelling public that is inevitable after the war. The existing traffic, accounting, rate, canvassing, and other personnel of the two railways concerned will be used, as well as their offices and

station facilities. Present lorry and bus equipment will also be utilised, where possible, in transporting passengers and freight between railway stations and airports. The air services proposed will link up 108 cities as terminals and junction points, over a large area of the United States, and in view of the certain development of air transport on a nation-wide scale after the war, the railways desire, as far as practicable, to safeguard the traffic within their own territory.

Swedish Strategic Canal

The Falsterbo Canal, cut through the south-western tip of Scania, to provide a safe passage for Swedish steamers, and to shorten the route from the Baltic to the Oresund, is reported to have been used by 10,000 vessels from its completion in August, 1941, until July, 1943.

Road Traffic in Norway

According to an Order recently issued by the Traffic Section of the Norwegian Department of Economic Affairs, no goods may be conveyed by motor lorries over distances exceeding 30 km. (19 miles) if there is an alternative route by rail or ship between the places concerned. Exceptions may be authorised by the Transport Committees for perishable foodstuffs.

A bus company named the Haugesund-Tittelsnaes Billag Aktieselskabet has been established recently at Haugesund to operate road services between Haugesund and Bergen, via Tittelsnaes. The company's share capital of Krone 40,000 has been subscribed jointly by the shipping company known as the Hardanger Sunnhordlandske Dampsksibsselskab, and by the Municipalities of Vikebygd, Valestrand, and Sveio.

Curtailment of Hungarian Bus Traffic

Because of the shortage of motor fuel and tyres, the Hungarian Ministry of Communications issued an Order suspending all bus services throughout the country on Sundays and holidays as from November 5. An exception is made in respect of three services in the south-eastern tip of the country because of the poor railway communications there. The three routes are: Székelyudvarhely-Csikszereda, 32 miles; Székelyudvarhely-Szászregen, 53 miles; and Marosvasarhely-Székelykeresztsz, 50 miles. These routes are in Hungarian-occupied Transylvania; under Roumania the place names were: Odorhei (Székelyudvarhely), Ciceu (Csikszereda), Reghin

(Szászregen), Targu Muresh (Marosvassárhely), and Cristur (Székelykeresztsz). The restriction does not affect works buses.

Hungarian Road Development

Among new roads in Hungary completed in recent months, two were opened to traffic early in October. They are in the Russo-Carpathian part of Czechoslovakia, and connect the valley of the Black Tisza River with that of the Tarac River (a tributary of the Tisza). Along the former valley the main railway line leads to Korosmezo, on the Hungarian frontier, while the Tarac valley is served by a 38-mile narrow-gauge forest railway known as the Taracvölgy Erdei Vasut connecting at Tarackoz with the Debrecen-Korosmezo main line. Tarackoz was formerly known as Teresulj.

Important Turkish Railway Project

It is reported that a 99-mile railway to connect the cities of Narli, Antep, Nizip, Birecik, and Kardanis is projected for southern Turkey. Necessary material and equipment are stated to be available, and construction will begin immediately. It would appear that this line is intended to provide a cut-off entirely on Turkish soil, avoiding the Syrian detour to Aleppo of the main Baghdad Railway. At present, the South Turkish Railway is isolated from the main system of the Turkish State Railways, excepting by traversing part of Syria. A branch line connecting Antep and Kilis is being considered.

The Smyrna Tramways

During the financial year 1941-1942, the Turkish Government expressed its intention of taking over the concession and equipment of the Turkish Tramway & Electricity Company of Smyrna, a subsidiary of the Electricité et Tramways en Orient, of Brussels; the latter company is controlled by the Société Générale de Belgique. Negotiations were subsequently completed, and the agreement approved by a general meeting of the Smyrna company. This agreement was adopted by the Turkish National Assembly on July 19 last. The Turkish Government is to pay the Smyrna company Swiss Francs 10,233,800 for the purchase of its plant and concessions. This is to be transferred two months after the conclusion of hostilities in Europe and in the Eastern Mediterranean. It is to bear interest at 5 per cent. from January 1, 1943. The transfer is to take the form of goods to be exported to European countries (Sweden and Switzerland excepted).

Central Uruguay Railway Co. of Monte Video Ltd. Annual Meeting

The ordinary general meeting of the Central Uruguay Railway Co. of Monte Video Ltd. was held at River Plate House, London, E.C.2, on December 29. Brigadier-General F. D. Hammond, C.B.E., D.S.O., Chairman of the company, presided.

The Chairman, in the course of his statement issued with the report, said that the year under review had been abnormal in most of its features. During the first half, despite an all-round increase in tariffs of 10 per cent., gross receipts had shown an increase of only 1 per cent. over the corresponding period of the previous year; and working expenses had risen to a greater extent, and there was actually a loss on revenue account over the first six months. More important tariff increases had been introduced in November for passengers, and in January for goods and livestock. Meanwhile one of the worst droughts in the history of the country had occurred, and a heavy traffic had sprung up in the transport of cattle to the freezing establishments, and of forage from the ports to the camps. Also, at the turn of the year goods traffic had shown a marked improvement.

An outstanding difficulty was fuel; this continued throughout the year and was likely to last in some degree or other until the end of the war. In June, 1942, at a few days' notice, the monthly quota of oil fuel had been cut from 5,300 to roughly 3,000 tons. The company had been fortunate in obtaining a fairly regular though limited supply of coal, but a large gap was left, and it had had to convert many locomotives originally designed to burn oil to burn wood; their grate areas were so small that the local soft woods were useless, and hard woods had had to be imported. Even

so, haulage capacity was curtailed seriously, and the useful load was cut further by the necessity for hauling extra tenders. When to these drawbacks were added the heavy additional cost of handling and transporting the wood the cost a ton-km. hauled was considerably in excess of the figure for oil or coal. The wagon supply was seriously affected also. Besides the wagons used as extra tenders, a large number had to carry wood to the depots. The shortage of power and wagons had forced the company, since traffics had improved, to ration transport and to postpone, and even to refuse, loadings. That was an unique experience for a railway of that type, which normally was subject to acute competition, and was due to the fact that motor transport had been hit even more severely by the shortage of fuel oils.

Passenger services by both motor coach and passenger train had had to be curtailed. To compensate in part, mixed trains, carrying both passengers and goods, had been introduced, but they naturally were less satisfactory from the point of view of the passenger.

The board regarded the question of renewals as of paramount necessity. Unfortunately, the bad financial situation during the first half of the year had precluded the possibility of applying to them any substantial funds until well into the second half. The renewals charge of £159,759 in the accounts had been incorporated in the working expenses instead of by an appropriation from net revenue account, thus giving a truer picture of the cost of running and maintaining the railway. During the year, however, the company had been able to spend only £120,924, and the balance remained in the renewals reserve account as a contribution

to help make good some of the arrears. Nor did the figure of £159,759 cover the renewal requirements for the past year, so that, instead of being able to make any headway against the arrears, further depreciation had taken place. With the improvement in receipts it was hoped to be able to devote a substantially larger sum to the purpose during the current year.

It would be noticed that, whereas since the reconstruction scheme of 1937 the company had had a small surplus in net revenue account to carry forward, it now showed a debit balance of £212,875. Under that scheme the interest on the second debenture stock up to June 30, 1942, was payable only to the extent that there were surplus earnings available as defined in the trust deed; none, in fact, was paid. From July 1, 1942, the interest became payable in full, although by the moratorium scheme of February, 1943, payment was deferred at the discretion of a stockholders' committee appointed under the scheme. That applied also to the interest on the first debenture stock from and including that payable on June 30, 1943. The full interest on both stocks, however, was accrued, and remained a liability of the company, and in consequence the deficit on net revenue account included all such interest.

Turning to future prospects, he said that some 45,000 tons of goods had been awaiting transport at the end of the financial year due to inability to handle it earlier; and, coupled with the rate increases, accounted for the improvement shown up to date in gross receipts. A good wool clip was expected, and was assured of a sale under agreement with the U.S.A. On the other hand, although sheep suffered comparatively little from the drought and recovered soon, upwards of 600,000 head of cattle were estimated to have died, and that depletion must have an effect on the general economy of the country.

The report and accounts were adopted.

Fuels in Argentina

A comment on the Argentine fuel position published recently by the United States Chamber of Commerce in that country, quoted by Reuters, states that insufficient attention to the exploitation of her own natural fuel reserves and dependence on imports for reasons merely of price have placed Argentina at the mercy of shipping conditions. A result of this has been a swing to the more readily available, but less satisfactory, fuels, notably wood and charcoal, with consequent rapid depletion of the limited forest reserves. Hydro-electric power, it is stated, has not been utilised even to the full extent of the limited existing installations.

With the growth of industries, application of mechanical methods to agriculture, and increase in mechanical transport, the rate of consumption of fuel energy in Argentina has doubled in the last twenty years, during which period increased rail transport accounted for comparatively little of the rise. Petroleum, coal, and wood were approximately equal suppliers of energy in 1922, and together accounted for roughly 80 per cent. of the total. At that time all of the wood, none of the coal, and only 33·6 per cent. of the petroleum was of national origin. During the ensuing twenty years development of Argentine oilfields has proceeded at a more or less constant rate, if not rapidly enough to

supplant all imports. In 1941 national petroleum production accounted for 63·4 per cent. of the consumption; the remainder was imported. Coal and wood consumption, with some fluctuations, remained relatively static until 1940, when shipping difficulties caused a decided drop in the quantity of coal used, 98·6 per cent. of which was still imported in 1941.

The continued rise of petroleum consumption in Argentina has led the increase in national production, but the two values have tended to approach one another. In 1933-34 national production was rising at a rate greater than that of consumption, and was well on the way toward supplying the demand, a state of affairs apparently attributable, it is stated, entirely to the enterprise of private companies. Thereafter, however, the effect of government policy was to arrest the development of private production, to increase the fiscal volume.

Coal consumption has fluctuated appreciably over the past twenty years but has shown no tendency to increase generally. Practically speaking, it can be said that all of this coal has been imported, for in spite of the increasing number and variety of known native deposits, as late as 1941 the country produced no more than 1·4 per cent. of the coal it consumed.

For many years a considerable quantity of wood has been used as fuel. Fifteen or twenty years ago railways consumed a good proportion; figures show

that they made a consistent effort to abandon wood fuel until forced to return to it increasingly since 1939.

The curtailment of coal imports apparently has produced a more serious swing towards wood fuel than towards charcoal. In general, charcoal is consumed in the larger cities, and only about 11 per cent. is used at its point of production. Nevertheless, there have been several new industrial applications of charcoal during the war. Steel makers are beginning to use it for a coke substitute, and lead smelters already have adopted it for this purpose, finding that the charcoal of the *quebracho blanco* can be made to perform in their furnaces, and that the roasters will operate on any type of charcoal. There has been also a small export trade.

Although recent conditions have increased the reliance on agricultural and industrial residues as fuel to an appreciable extent, the increase is by no means as large as might be expected. There has been a more or less constant use of most of these materials for the last twenty years, and the publicity given to their use now is somewhat misleading in that it tends to create the idea that a new way has been found to keep plants running. The many factories located far from access to ocean shipping, always have found it simpler to burn their residues than to haul imported or national fuels over long distances. Failure to employ these residues for fuels would mean their disposal by other means.

Notes and News

District Locomotive Superintendents Required.—The services of two district locomotive superintendents are required by the Sudan Railways. Details are given in our Official Notices, page 27.

Assistant District Running Superintendent Required.—The Nigerian Railway requires the services of an assistant district running superintendent. Details are given in our Official Notices, page 27.

Agreed Charges.—Applications have been made to the Railway Rates Tribunal for the approval of 47 further agreed charges under the provisions of Section 37 of the Road & Rail Traffic Act, 1933. Notices of objection must be filed on or before January 14.

Public Works Programme for Uruguay.—A programme of public works estimated to cost 40,000,000 pesos, and including the construction of railways, roads, and irrigation works, has been approved by the Uruguayan cabinet. The programme will cover three years. The cabinet has approved also a re-afforestation programme which will be financed from funds made available by U.S.A. Import-Export Bank loan, and by a local bond issue.

Road Haulage Rates Officer.—We are informed by the Road Transport Organisation Joint Conference, of which the Secretary is Mr. G. W. Quick Smith, that the appointment will be made shortly of a Rates & Charges Officer to serve the Road Haulage Association which is to be established to protect the interests of public carriers of goods by road. This step follows the decision to merge seven existing road transport organisations. An official advertisement seeking applicants for this position appears on page 27.

Jungfrau Railway.—The number of passengers carried by the Jungfrau Railway in 1942 was 65,000, compared with 61,000 in 1941. Of working receipts, which amounted to fr. 801,000 (fr. 636,000), passenger traffic accounted for fr. 395,000 (fr. 324,000). Working expenditure rose from fr. 339,000 in 1941 to fr. 372,000, and a working profit resulted of fr. 429,000 (fr. 297,000). A financial reconstruction of the company, begun in 1940, enabled the unfavourable balance of fr. 736,000, which had resulted in 1941, to be wiped out; and a net surplus of fr. 79,000 resulted for 1942.

Presentation to Mr. W. M. Perts.—At an informal gathering of principal officers of the Southern Railway on December 23, Mr. W. M. Perts, Commercial Superintendent, was the recipient of a gift in connection with his retirement, after 52 years' service. In short speeches, the Traffic Manager, Deputy General Manager, Solicitor, Chief Accountant, Deputy Traffic Manager, and Audit Accountant, and the new Commercial Superintendent, paid tribute to Mr. Perts' personal qualities of wisdom and integrity, and to his business ability, keen perception, and helpful personality. Mr. E. J. Missenden, General Manager, in making the presentation, said that seldom had such fine tributes been paid to an officer on his retirement—tributes, he said, which so fully were justified. He referred to the loss which all would feel on his retirement, and wished him on behalf of his fellow officers "long life and good health." Mr. Perts, after expressing his thanks, paid tribute to the many general managers under whom he had served, and spoke feelingly of the guidance he had always received from Mr. Missenden. Mr. Perts referred to the harmony which had existed between the

chief officers and himself, and concluded with a tribute to his successor, Mr. A. E. Hammett, in whose hands, he said, he knew he could leave safely the Commercial Department.

Argentine State Railways.—The Argentine Government has approved the balance sheet of the State Railways for the fiscal year 1942, showing income at 134,335,000 pesos, and expenditure at 129,848,000 pesos.

L.M.S.R. Road-Vehicle Mileage.—Although L.M.S.R. road motor vehicles moved two million more tons of goods in 1943 than in 1939, their mileage has been reduced by nine million motor-miles, principally as a result of careful reorganisation of the company's collection and delivery services.

Irish Customs on Trains.—In the Northern Ireland Senate on December 16, Prof. R. Corkey, Leader of the House, said that the Government did not consider that customs examinations of train passengers to and from Eire could be made during the journey. The customs authorities held the view that a thorough search was not practicable while trains were in motion. There were no facilities in trains for personal searches. Senator McLaughlin complained that at least 4 hr. were lost in cross-border journeys through delays due to customs inspectors.

Railway Rates Tribunal Sittings.—The Court will sit on Tuesdays, January 18, February 15, March 21, April 18, May 16, June 20, July 18, October 17, November 14, and December 12, 1944, to hear applications as to the granting of new or the reduction of existing exceptional rates. It will also sit on Tuesdays, January 25, April 25, July 25, and October 24, to hear applications as to classification of merchandise; applications as to reductions to be made from standard charges where damageable merchandise is carried under owner's risk conditions; and applications as to rebates under the Railway Freight Rebates Scheme

Compañía de los Ferrocarriles de La Robla.—The number of passengers carried in 1942 by the La Robla Railways (Spain) was 1,054,144; and coal and general goods traffic amounted to 612,134 tonnes and 272,676 tonnes, respectively. Working receipts of the company for the year under review were 20,400,000 pesetas, of which passenger receipts accounted for 2,700,000 pesetas, coal traffic for 12,600,000 pesetas, and general merchandise for 4,500,000 pesetas. Miscellaneous receipts amounted to 500,000 pesetas. Working expenditure was 14,900,000 pesetas. A dividend of 5½ per cent., absorbing 2,600,000 pesetas, was paid.

South American Trade after the War.—In the course of his statement recently circulated to stockholders, Lord Wardington, Chairman of the Bank of London & South America Limited, said that, in aiming at the ideal of a real equilibrium in trade there must be general recognition of the fact that, from the point of view of Great Britain, the balance of payments could be maintained only by the restoration of export trade, and, in fact, its expansion above the pre-war level to an extent counteracting increased national indebtedness and the loss of a great part of invisible exports, such as income from overseas investments, shipping, and others. Plans prepared by the British Government on the one hand, and by industrialists on the other, for post-war trade in South America—which might call for a high degree of co-operation, as distinct from control—must be on a realistic basis entirely free from any suggestion of *laissez-faire*.

With careful study of the requirements of each market, combined with modern salesmanship, the outstanding reputation of British goods should assist in enabling manufacturers to regain a great part of South American markets, especially in view of the pent-up demand for both capital and consumer goods and the elimination of cheap competition from Germany and Japan. The large outstanding exchange balances of Latin America represented mainly an accumulation of delayed purchases abroad which could not

British and Irish Railway Stocks and Shares

Stocks	Highest 1943	Lowest 1943	Prices	
			Jan. 4, 1944	Rise/ Fall
G.W.R.				
Cons. Ord. ...	65	57½	62	—
5% Con. Pref. ...	120	108	117	—
5% Red. Pref. (1950) ...	110	106	107	+ 1
5% Rt. Charge ...	137	123	129	+ 1
5% Cons. Guar. ...	135	121½	128	+ 1
4% Deb. ...	111	107	113	+ 1
4½% Deb. ...	119	109½	113	+ 1
5% Deb. ...	124	116	119	—
5% Deb. ...	138	127	129	—
2½% Deb. ...	77	72	72½	—
L.M.S.R.				
Ord. ...	34½	23	34	+ 1
4% Pref. (1923) ...	66	58	63	+ 1
4% Pref. ...	80	73	7½	+ 1
4% Red. Pref. (1955) ...	1054	92	101	+ 1
4% Guar. ...	107	96	105	+ 1
4% Deb. ...	109	103	104	+ 1
5% Red. Deb. (1952) ...	111½	108	109	+ 1
L.N.E.R.				
5% Pref. Ord. ...	12½	78	10½	—
Def. Ord. ...	58	38	5	—
4% First Pref. ...	66	57½	62	+ 1
4% Second Pref. ...	36	30	34	+ 1
5% Red. Pref. (1955) ...	99	93	98	+ 1
4% First Guar. ...	102	94	99	+ 1
4% Second Guar. ...	93	85	91	+ 1
3% Deb. ...	86	78	81½	+ 1
4% Deb. ...	109½	101	104	+ 1
5% Red. Deb. (1947) ...	106	102	103	+ 1
4½% Sinking Fund Red. Deb. ...	108	103	104	—
SOUTHERN				
Pref. Ord. ...	80	72½	76	—
Def. Ord. ...	26	20	25	+ 1
5% Pref. ...	119	106	116	—
5% Red. Pref. (1964) ...	114	100	112	—
5% Guar. Pref. ...	136	122	127	—
5% Red. Guar. Pref. (1957) ...	117	109	112	—
4% Deb. ...	117	106	111	—
5% Deb. ...	137	126	127	—
4% Red. Deb. (1962-67) ...	112	106	107	—
4% Red. Deb. (1970-80) ...	112	107	108	—
FORTH BRIDGE				
4% Deb. ...	109	104	105	—
4% Guar. ...	105	102	102	—
L.P.T.B.				
4½% "A" ...	125½	114	119	+ 1
5% "A" ...	133½	123	128	+ 1
3% Guar. (1967-72) ...	100	97	99	+ 1
5% "B" ...	124	114	118	—
"C" ...	72	53	65	—
MERSEY				
Ord. ...	34	27	34	+ 1
3% Perp. Pref. ...	68	59	66	+ 1
4% Perp. Deb. ...	104	102	103	—
3% Perp. Deb. ...	83	78	79	—
IRELAND				
BELFAST & C.D. Ord. ...	9	6	7½	—
G. NORTHERN				
Ord. ...	24	16	22	—
Pref. ...	—	—	42	—
Guar. ...	—	—	60	—
Deb. ...	—	—	81	—
G. SOUTHERN				
Ord. ...	30	9½	29	—
Pref. ...	30	11	30	—
Guar. ...	64	26½	62½	+ 1
Deb. ...	88	51	86	—

\$ ex-dividend

SUDAN RAILWAYS require the services of TWO DISTRICT LOCOMOTIVE SUPERINTENDENTS. Candidates must be fully qualified Locomotive Engineers both in theory and in practice. Must have graduated in Mechanical Engineering from a University and/or must be Corporate Members of the Institution of Civil Engineers or of the Institution of Mechanical Engineers, must have served an apprenticeship or pupillage of not less than four years on a railway or with a firm of locomotive builders of repute, and must have filled a position of responsibility in Locomotive Engineering for not less than one year.

TERMS:

Either

(1) Starting rate of pay £E.480 per annum or such higher rate as age and qualifications justify, with periodical increases of pay in accordance with Government Scales, viz., £E.480-540-600-660-720-780-852-936, all increases being biennial with the exception of the last one, which is triennial. Selected candidates will be appointed on Probationary Contract for two years and subscribe to the Provident Fund, after which, if accepted to serve towards pension, their contributions will be transferred to the Pension Fund.

Or

(2) Short Term Contract for two years, which may be extended for further periods. Pay £E.640 per annum or such higher rate as age and qualifications justify. A bonus of one month's pay for each completed year of service will be given at the termination of the contract.

£E.1 = £1 0s. 6d. Free passage on appointment. Strict medical examination. At present there is no income tax in the Sudan.

Applicants should write to the Ministry of Labour and National Service, Central (Technical and Scientific) Register, Advertising Section, Alexandra House, Kingsway, London, W.C.2, for the necessary application forms. The reference number C.1680A must be quoted.

be made during wartime, and where they were in sterling, were virtually blocked, and constituted a reservoir of exchange which should be available immediately after the war to pay for resumed exports from the sterling area.

U.S.A. Railway Strike Cancelled.—Eighteen hours before it had been due to commence, the railway strike in the U.S.A., planned for December 30, was called off. Two of the five railway operating unions, and the non-operating unions, previously had agreed to accept the arbitration of President Roosevelt, and the remaining three operating unions later agreed to fall into line and cancel their strike plans.

Swiss Locomotive Building.—An order for two express passenger locomotives has been placed recently by the Bern-Lötschberg-Simplon Railway with the Brown Boveri Company, of Baden. These locomotives are for electric operation; they have four driving axles which carry a load of 80 tons between them. This is the total weight as there are no supporting wheels; the claim is made that existing locomotives weigh 60 tons more than the new locomotives which, nevertheless, are capable of hauling a train of 420 tons at an average speed of 47 m.p.h. over a mountainous route.

New Electric-Battery Vehicle.—Lord Leathers, Minister of War Transport, recently inspected the prototype of a national standard electric vehicle, produced by a committee of leading electric-vehicle designers working under the aegis of the Electric Vehicle Association. Its advantages were explained by a deputation headed by Sir Felix Pole, President of the Association, which included Mr. H. G. Wilson, Chairman of the committee responsible for the design and construction. The vehicle can be produced quickly by any manufacturer from standard drawings, and parts will be interchangeable. It carries a payload of one ton, is rated at 8 h.p., and is fitted with a universal body adaptable to individual requirements of side or rear loading. The price, including body, but less battery and charger, is (subject to wartime emergencies) £355.

OFFICIAL NOTICES

OVERSEAS EMPLOYMENT. ASSISTANT DISTRICT RUNNING SUPERINTENDENT required for the Nigerian Government Railway for one tour of 12 to 24 months in the first instance, with possibility of permanency. Salary £475, rising to £920 a year, with efficiency bar at £630. Separation allowance for married men about £75 on salary of £475, reducing on a sliding scale until it ceases on salary of £600 or over. Free passage and quarters. Candidates must have served a recognised apprenticeship in the locomotive repair workshop and thereafter have had running shed and footplate experience and some subsequent experience in a railway running department. They should preferably be Associate Members of the Institution of Mechanical Engineers or hold an equivalent qualification. Drawing Office experience an advantage.

Applications in writing (no interviews), stating date of birth, full details of qualifications and experience, including present employment; also Identity and National Service or other registration particulars, and quoting reference No. O.5848.S., should be addressed to the Ministry of Labour and National Service, Appointments Department, Sardinia Street, Kingsway, London, W.C.2.

A OLD ESTABLISHED FIRM of Engineers' Agents, having well-appointed offices in Pall Mall, London, with an experienced Technical Sales organisation in direct contact with the principal Government Departments, railway undertakings, important industrial concerns, at home and abroad, and accustomed to negotiating large contracts, is willing to consider proposals from Provincial Manufacturers of repute in both the Mechanical and Electrical Engineering branches of industry who are seeking London representation on a payment by result basis. They are well placed for post-war reconstruction schemes, etc., in occupied and other territories. Enquiries will be treated in strict confidence.—Engineers Publicity, Ltd., 3, St. James Square, London, S.W.1,

British Vehicle Producer Gas Limited.—It is announced in *The London Gazette* of December 14, 1943, that a winding-up Order has been made in respect of this company.

Hull Corporation Seeks Air Powers.—Application has been made to Parliament by the Corporation of Kingston-upon-Hull for leave to introduce a Bill under the title Kingston-upon-Hull Corporation (Air Transport). The Bill proposes to empower the Corporation to provide air transport services from and to the City of Hull or its neighbourhood and to make provision for other purposes.

Locomotive Costs.—Statistics issued recently by the Association of American Railroads show that for the period 1936-40 the average initial costs of American steam freight locomotives ranged from \$103,028 to \$201,534; of steam passenger locomotives, from \$49,850 to \$168,164; and of steam shunting locomotives, from \$21,909 to \$55,355. Those of electric passenger

Road Haulage Association
APPOINTMENT OF RATES AND CHARGES OFFICER

FOLLOWING the decision to merge seven existing national road transport organisations, the appointment will shortly be made of a Rates and Charges Officer to serve the Road Haulage Association which is to be created to protect the interests of public carriers of goods by road. The salary will be fixed according to ability and experience.

Applicants should have knowledge of transport rates, costing and accountancy. The successful applicant may be required to take up his duties at an early date.

Applications, which must be in writing, must be submitted by January 31st, 1944, and must be accompanied by a completed form obtainable from the Secretary, Room 350, Coastal Chambers, 15, Elizabeth Street, London, S.W.1.

WARTIME ASSISTANT EDITOR

A TEMPORARY ASSISTANT EDITOR is required for a weekly journal with international circulation, to fill a war service vacancy. Must be able to write shorthand, report meetings, etc., and able to write with knowledge of transport management, policy and finance. Knowledge of engineering export trade desirable. Must be accustomed to control of staff and to proof reading, and seeing paper to press. Apply, Box 4144, 33, Tothill Street, S.W.1.

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. The charge for these advertisements is 2d. per word with a minimum of 10 shillings for each insertion. All advertisements should be addressed to :—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

locomotives were \$247,894; of electric freight locomotives, \$446,274; and of electric shunting locomotives, \$68,185. Initial costs of diesel-electric passenger locomotives were \$204,988; of diesel-electric freight locomotives, \$60,268; and of diesel-electric shunting locomotives, \$70,948.

L.N.E.R. Bicycle Stands.—During recent months seventeen L.N.E.R. stations have been provided with additional accommodation for 487 bicycles, largely for R.A.F. personnel; and, as further aerodromes come into operation, others will be dealt with similarly. Plans have been made for providing at 122 stations accommodation for the storage of more than 3,100 additional bicycles. Two principal types of bicycle stand have been adopted, one for erection on open ground, and the other for construction against a wall or the end of a building. Both are built on the unit principle, facilitating rapid erection; the units are of pre-fabricated concrete, and the roofs consist of corrugated asbestos sheets.



So successful has been the station tea bar introduced by the Southern Railway at Andover Junction (described and illustrated in our June 4, 1943, issue) that others are being provided. Above is shown that recently installed at Chichester

Railway Stock Market

Sentiment in Stock Exchange markets was aided by the encouraging trend of the war news. Values in most sections tended to improve, despite very little increase in the volume of business. Home railway stocks were in better demand. The approach of the dividend season continued to draw attention to the generous yields on ordinary stocks. Moreover, yield considerations also attracted buying of L.M.S.R. and L.N.E.R. preference stocks; it is pointed out that L.N.E.R. first preference, and also L.M.S.R. 1923 preference, still offer yields of nearly 6½ per cent. L.N.E.R. second preference returns nearly 7½ per cent. In the case of L.M.S.R. senior preference the yield of not far short of 4½ per cent. is not unattractive when considered in relation to the investment merits of this stock. There has been also a better tendency in prior charges, partly because of the trend in gilt-edged. Moreover, Great Western and Southern preference stocks were inclined to show further improvement. Great Western 5 per cent. preference yields 4½ per cent., and Southern 5 per cent. preference slightly over this rate.

The market remains hopeful of a better distribution on L.M.S.R. ordinary, but hopes are not pitched higher than 2½ per cent. This would compare with 2½ per cent. paid for 1942, when slightly over 3 per cent. was earned on the ordinary stock; but if it is again decided to place £400,000 to war contingency reserve, the payment will apparently have to be limited to 2½ per cent. In some quarters

there is continued talk of a slightly better payment of 2½ per cent., as against the 2½ per cent. paid for 1942, on L.N.E.R. second preference. Current views are that Southern and Great Western dividends are likely to be unchanged. The better demand for home railway juniors is, however, based mainly on the more encouraging views which have gained ground as to the post-war position of the railways. It is realised that hopes of better dividends are very slender so long as the fixed rental agreement is in force; but yields are substantial, and bearing this in mind, there seems scope for appreciation in home railway stocks if the general trend of markets continues to improve. London Transport "C" moved slightly higher, despite the moderate yield. The latter has to be read in relation to expectations of better dividends on this stock after the war; sentiment also reflects the view, that whatever the post-war developments affecting the railways, there is unlikely to be any change in the capital of London Transport.

Compared with a week ago, Great Western ordinary has been well maintained at 62 at the time of writing; the 5 per cent. preference was fractionally higher at 117, the guaranteed stock 128, and the 4 per cent. debentures 113½xd. L.M.S.R. ordinary was more active, and after easing to 33½, rallied to 33¾. L.M.S.R. 1923 preference was half-a-point better at 62½, the senior preference 77, and the guaranteed stock moved higher to 101½. L.N.E.R. first guaran-

tee was better at 99, as was the second guaranteed at 90½, and the 4 per cent. debentures strengthened to 104. L.N.E.R. second preference at 34½, and the first preference at 61½, failed to keep best prices recorded recently. On the other hand, Southern deferred was 25½, compared with 25½ a week ago, and the preferred has been well maintained at 76. The last-named stock yields fully 6½ per cent. on the basis of its full 5 per cent. dividend, which can, of course, be considered as virtually guaranteed by the fixed rental agreement. Southern deferred has continued to attract attention as a means of participating in the trend of home railway stocks, as it is the lowest-priced junior stock in the dividend list. London Transport "C" was 65, compared with 64½ a week ago.

Sentiment as to Argentine railway stocks tended to improve. The recent increase in tariffs for the carriage of livestock was inclined to increase hopes that the Argentine authorities are at long last to give greater consideration to the problems of the British-owned railways. B.A. Gt. Southern ordinary improved from 14½ to 14¾, and the 5 per cent. preference from 28 to 28½. B.A. Western ordinary was 12½, compared with 12½; the 4 per cent. debentures rose to 57. Antofagasta preference eased to 47. Canadian Pacifics were maintained at 16½. Madras & Southern Mahratta stock remained at 108, following the announcement of the desire of the Indian Government to purchase the railway.

Traffic Table and Stock Prices of Overseas and Foreign Railways

Railways	Miles open	Week ending	Traffic for week			Aggregate traffics to date			Shares or stock	Prices				
			Total this year	Inc. or dec. compared with 1941/2	No. of Weeks	Totals		Increase or decrease		Highest 1943	Lowest 1943	Jan. 4, 1944	Yield % (See Note)	
						1942/3	1941/2							
South & Central America														
Antofagasta (Chile) & Bolivia	834	26.12.43	£27,020	+ 260	52	£1,483,060	£1,150,320	+ 33,740	Ord. Stk.	15½	10	13½	Nill	
Argentine North Eastern	753	25.12.43	13,50	+ 3,82	26	365,251	341,828	+ 23,514	6 p.c. Deb.	22½	18	21½	Nill	
Bolivar	174	Nov. 1943	5,143	- 1,237	48	57,956	53,519	+ 4,437	Bonds	23½	19	20	Nill	
Brazil	...	...	...	...	...	...	...	...	...	...	...	...	...
Buenos Ayres & Pacific	2,807	25.12.43	114,900	+ 6,060	26	2,430,300	2,341,140	+ 89,160	Ord. Stk.	8½	5½	7	Nill	
Buenos Ayres Great Southern	5,080	25.12.43	182,820	+ 19,740	26	4,0,0,840	3,725,580	+ 355,260	Ord. Stk.	17½	9½	14½	Nill	
Buenos Ayres Western	1,930	25.12.43	58,800	+ 1,200	26	1,33,820	1,31,260	+ 19,020	"	16	9½	12½	Nill	
Central Argentine	3,700	25.12.43	15,872	+ 38,472	26	3,620,493	3,287,982	+ 332,50d	Dfd.	10½	6½	9½	Nill	
Do.	...	...	...	...	...	...	...	...	...	...	...	...	...
Cent. Uruguay of M. Video	972	25.12.43	39,077	+ 11,112	26	62,547	58,585	+ 24,962	Ord. Stk.	7½	4½	5½	Nill	
Costa Rica	262	Nov. 1943	19,893	+ 6,310	21	114,386	64,960	+ 49,426	Stk.	16	12½	15	Nill	
Dorada	70	Nov. 1943	25,000	+ 8,470	44	243,607	173,705	+ 69,92	I Mt. Db.	96	92	93½	6½	
Entre Rios	808	25.12.43	17,653	+ 480	26	504,936	476,412	+ 28,524	Ord. Stk.	9	5½	7	Nill	
Great Western of Brazil	1,030	25.12.43	22,100	+ 4,500	52	881,800	625,200	+ 256,600	Ord. Sh.	59/9	24½	30	Nill	
International of C. Amer.	794	Nov. 1943	\$565,434	+ \$83,910	47	\$6,589,280	\$5,554,318	+ \$1,034,962	1st Pref.	2½	1½	1½	Nill	
Interoceanic of Mexico	—	—	—	—	—	—	—	—	5 p.c. Deb.	90	80	87½	Nill	
La Guaira & Caracas	22½	Nov. 1943	7,545	- 1,340	48	90,905	80,810	+ 10,095	Ord. Stk.	7½	4½	5½	Nill	
Leopoldina	1,918	25.12.43	53,945	+ 11,287	52	1,860,878	1,54,3,283	+ 27,595	5 p.c. Deb.	90	80	87½	Nill	
Mexican	483	21.12.43	ps. 403,000	+ ps. 90,500	25	ps. 9,966,500	ps. 7,150,700	+ ps. 2,831,00	Ord. Stk.	14½	4	5½	Nill	
Midland Uruguay	319	Sep. 1943	16,809	+ 3,923	45	2,265	153,913	+ 35,992	—	—	—	—	—	
Nitrate	382	15.12.43	6,875	+ 2,265	50	182,165	182,165	- 28,222	Ord. Sh.	83/9	71/3	72½	Nill	
Paraguay Central	274	24.12.43	853,93	+ 84,468	26	\$1,356,216	\$99,900	+ \$365,316	Pr. Lt. Stk.	75	51½	69	8½	
Peruvian Corporation	1,059	Nov. 1943	10,629	+ 26,995	22	521,655	414,622	+ 107,023	Pref.	17½	10½	11½	Nill	
Salvador	100	Oct. 1943	c 67,000	+ c 14,000	17	c 35,000	c 236,000	+ c 99,000	Ord. Stk.	71	57	58½	3½	
San Paulo	1534	19.12.43	52,675	+ 13,156	51	2,259,935	1,890,596	+ 369,039	Ord. Stk.	37/6	20/-	22½	Nill	
Talca	160	Nov. 1943	5,250	- 313	21	27,500	25,403	+ 2,097	Ord. Sh.	8½	3½	3½	Nill	
United of Havana	1,301	25.12.43	52,367	+ 6,755	26	1,184,086	1,124,141	+ 59,945	Ord. Stk.	—	—	—	—	
Uruguay Northern	73	Sep. 1943	1,283	+ 176	13	4,110	3,305	+ 805	—	—	—	—	—	
Canada	17,034	21.12.43	1,256,400	+ 94,000	51	57,665,600	49,812,600	+ 7,853,000	Ord. Stk.	18	13½	16½	Nill	
India	Barai Light	202	Aug. 1943	15,285	22	107,055	76,587	+ 30,468	—	—	—	—	—	
Bengal-Nagpur	3,267	Occ. 1943	1,001,025	+ 138,600	30	7,209,525	6,162,825	+ 1,046,700	Ord. Stk.	104½	101½	102½	3½	
Madras & Southern Mahratta	2,939	10.10.43	247,050	- 1,7	28	5,325,600	4,541,813	+ 763,787	—	110	106	107½	6½	
South Indian	2,349	31.10.43	203,79	+ 17,598	30	4,214,375	3,709,442	+ 504,933	—	105½	101½	105½	4½	
Various	Egyptian Delta	—	31.10.43	22,313	+ 5,063	32	314,521	241,710	+ 72,811	Prf. Sh.	6½	2½	4½	Nill
Manila	Midland of W. Australia	277	Oct. 1943	33,998	- 1,095	17	135,691	119,414	+ 16,277	B. Deb.	45	32	42½	8½
Nigerian	—	25.9.43	67,776	- 9,339	25	1,6,7,044	1,489,022	+ 18,022	Inc. Deb.	101	93	99	6½	
South Africa	—	30.10.43	825,805	+ 44,197	31	25,562,333	23,650,797	+ 1,991,653	—	—	—	—	—	
Victoria	—	4,774	July, 1943	1,40,891	+ 86,055	—	—	—	—	—	—	—	—	

Note. Yields are based on the approximate current prices and are within a fraction of ½. Argentine traffics are given in sterling calculated @ 16½ pesos to the £

† Receipts are calculated @ Is. 6d. to the rupee

§ ex dividend